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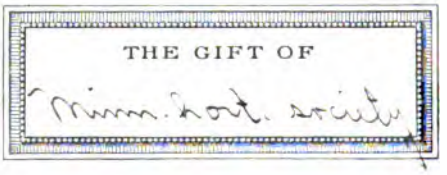
THE GIFT OF
Minn. hort. society

SB
21
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AS

R. J. Mendenhall

MINNEAPOLIS, MINN.

FIFTH PRESIDENT OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

[For biography see page 400 of this volume.]

ANNUAL REPORT

OF THE

Minnesota State Horticultural Society.

1892.

EMBRACING THE
TRANSACTIONS OF THE SOCIETY DURING THE YEAR ENDING
JAN. 13, 1893, PAPERS, DISCUSSIONS, REPORTS, ETC.

EDITED BY THE SECRETARY,
A. W. LATHAM, EXCELSIOR, MINN.

VOL. XXI.

SHORTHAND REPORTER,
J. H. SAVAGE, MINNEAPOLIS.

MINNEAPOLIS:
HARRISON & SMITH, STATE PRINTERS
1893

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LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY OF THE
MINNESOTA STATE HORTICULTURAL SOCIETY.

EXCELSIOR, MINN., March 31, 1893.

To Hon. Knute Nelson, Governor of Minnesota:

SIR:—In compliance with the requirements of the law, I have the honor to submit herewith the annual report of our society for the year ending January 13, 1893.

Respectfully yours,
A. W. LATHAM,
Secretary.

COMMUNICATION FROM THE SECRETARY.

EXCELSIOR, MINN., April 18, 1893.

Fellow-members of the Minnesota State Horticultural Society:

The present annual report, the third one which it has been my pleasant privilege to edit for you, is being completed in the hurry of preparation, at the last moment, before departing for another field of duties in your service, at the Columbian Exposition. The work has not, however, on this account been slighted, and I trust it may prove to be the best edited of the three. It requires, I am finding out, much experience to do this work well.

The topical arrangement is continued in the present volume to as complete a degree as is practicable.

Our members and friends from abroad have contributed liberally of their time and experience in giving value to this report, and to those who study its pages it will be found helpful and instructive, and pointing the road to success in horticultural pursuits in the Northwest.

Hoping to meet you at the Minnesota Horticultural Exhibit at the Columbian Exposition, where arrangements have been planned to make it pleasant for you,

I have the honor to remain,

Yours fraternally,

A. W. LATHAM,

Secretary.

OFFICERS FOR 1893.

PRESIDENT.

J. M. UNDERWOOD.....Lake City

VICE-PRESIDENTS.

CLARENCE WEDGE, First Congressional District.....Albert Lea
S. D. RICHARDSON, Second " " .....Winnebago City
L. E. DAY, Third " " .....Farmington
R. S. MACKINTOSH, Fourth " " .....Langdon
J. H. STEVENS, Fifth " " .....Minneapolis
MRS. JENNIE STAGER, Sixth " " .....Sauk Rapids
J. O. BARRETT, Seventh " " .....Brown's Valley

SECRETARY.

A. W. LATHAM.....Excelsior

TREASURER.

DITUS DAY.....Farmington

EXECUTIVE COMMITTEE.

(President, Secretary and Treasurer Ex-officio.)

WYMAN ELLIOT, (Chairman).....Minneapolis
J. S. HARRIS.....La Crescent
Prof. S. B. GREEN.....St. Anthony Park
O. F. BRAND.....Faribault
L. H. WILCOX.....Hastings

ENTOMOLOGIST.

PROF. OTTO LUGGER.....St. Anthony Park

LIBRARIAN.

(The Library is at Room 2, No. 427 Nicollet Avenue, Minneapolis.)

A. W. LATHAM.....Excelsior
E. A. CUZNER, (Assistant), Essex and 27th Ave. S. E.....Minneapolis
(The assistant has charge of the reports stored at Pillsbury Hall, State University.)

SUPERINTENDENTS OF EXPERIMENT STATIONS.

1893.

PROF. S. B. GREEN (Central Station, University Farm), St. Anthony Park
E. H. S. DARTT.....Owatonna
F. H. FIEDLER.....Fergus Falls
DEWAIN COOK.....Windom
CLARENCE WEDGE.....Albert Lea
CHAS. W. SAMPSON (grapes).....Excelsior
O. M. LORD (plums and small fruits).....Minnesota City
C. W. H. HEIDEMAN (plums and small fruits).....New Ulm
D. E. MYERS.....St. Cloud
H. M. LYMAN (apples).....Excelsior
J. S. HARRIS.....La Crescent
L. R. MOYER.....Montevideo

COMMITTEES FOR 1893.

GENERAL FRUITS.

FIRST CONGRESSIONAL DISTRICT.

C. THEILMANN.....Theilmanton
R. C. KEEL.....Rochester

SECOND CONGRESSIONAL DISTRICT.

J. S. PARKS.....Pleasant Mounds
F. S. LIVERMORE.....Fairmont

THIRD CONGRESSIONAL DISTRICT.

D. F. AKIN.....Farmington
E. J. CUTTS.....Howard

FOURTH CONGRESSIONAL DISTRICT.

M. C. BUNNELL.....Newport
J. G. BASS.....Hamline

FIFTH CONGRESSIONAL DISTRICT.

H. L. CRANE.....Excelsior
D. V. PLANTS.....Long Lake

SIXTH CONGRESSIONAL DISTRICT.

J. M. DOUDNA.....Alexandria
JOHN HUNTER.....Anoka

SEVENTH CONGRESSIONAL DISTRICT.

N. P. ASPINWALL.....Harrison
ERIK ANDERSON.....Lake Park

SEEDLING FRUITS.

J. S. HARRIS.....La Crescent

APPLES.

(Including crabs, hybrids, Russians, etc.)

D. K. MICHENOR.....Etna
G. W. BUFFUM.....Owatonna
W. L. PARKER.....Farmington
WM. DUFFUS.....Lake City
W. S. WIDMOYER.....Dresbach

PLUMS AND CHERRIES.

JOS. WOOD.....Windom
MRS. A. A. KENNEDY.....Hutchinson
H. KNUDSON.....Springfield

GRAPES.

P. H. PERRY.....Excelsior
H. J. LUDLOW.....Worthington
M. PEARCE.....Chowen

SMALL FRUITS.

M. W. COOK.....Rochester
E. E. HARRIS.....La Crescent
WM. ROBINSON.....Hastings
B. C. YANCEY.....Edina Mills
O. M. LORD.....Minnesota City

FRUIT BLOSSOMS.

(Cross-fertilization, etc.)

O. F. BRAND.....Owatonna
DR. M. M. FRISSELLE.....Eureka
R. S. MACKINTOSH.....Langdon

FORESTRY.

CLARENCE WEDGE.....Albert Lea
L. R. MOYER.....Montevideo
M. CUTLER.....Sumter

DECIDUOUS TREES AND SHRUBS.

C. L. SMITH, (Farmers' Tribune).....Minneapolis
DR. J. R. WALKER.....Leech Lake
C. W. H. HEIDEMAN.....New Ulm

EVERGREENS.

A. TERRY.....Slayton
R. C. KEEL.....Rochester

OUT-DOOR HERBACEOUS PLANTS.

(Native and exotic.)

MISS SARA M. MANNING.....Lake City
GUST. MALMQUIST.....Fair Oaks, Minneapolis
MRS. A. B. UNDERWOOD.....Lake City

HOUSE AND GREENHOUSE PLANTS.

MRS. M. E. POWELL.....St. Peter
MISS FRANCES E. HILLIKER.....Minneapolis
O. A. NORDQUIST.....St. Paul

VEGETABLES.

W. G. BEARDSLEY.....St. Louis Park
ROBERT R. GRAY.....Lake City
GEORGE JEHU.....Hastings
J. A. SAMPSON.....Excelsior

NOMENCLATURE AND CATALOGUE.

J. S. HARRIS.....La Crescent
PROF S. B. GREEN.....St. Anthony Park

HORTICULTURAL STRUCTURES AND IMPLEMENTS.

J. M. UNDERWOOD.....Lake City
L. L. MAY.....St. Paul

COOKING AND PASTRY STORES.

MRS. E. CROSS.....Sauk Rapids
MRS. ANNIE BONNIWELL.....Hutchinson

APICULTURE.

J. W. MURRAY.....Excelsior
BARNETT TAYLOR.....Forestville

ORNITHOLOGY.

MRS. LOUISE SAMSON.....2 Eleventh St. S., Minneapolis
FRANK I. HARRIS.....La Crescent
FRANK SHEPHERD.....Hastings

ENTOMOLOGY.

J. S. HARRIS.....La Crescent
PROF. S. B. GREEN.....St. Anthony Park

LIFE MEMBERSHIP.

O. F. BRAND.....Faribault
DITUS DAY.....Farmington
A. W. LATHAM.....Excelsior

LEGISLATION.

COL. J. H. STEVENS.....Minneapolis
WYMAN ELLIOT.....Minneapolis
F. G. GOULD.....Excelsior

ANNUAL MEMBERS.

ANNUAL MEMBERSHIP FEE $1.00. REMIT TO THE SECRETARY.

Andrews, J. P., 1893.....Faribault
Allyn, Joshua, 1893.....Red Wing
Austin, J. W., 1892.....Hardy, Montana
Anderson, Erik, 1893.....Lake Park
Aldrich, C. C., 1893.....Morristown
Abbot, C. A., 1893.....Saratoga
Aspinwall, N. P., 1893.....Harrison
Ashenbeck, J. H., 1893.....731, 6th Ave. N., Minneapolis
Anderson, J. S., 1893.....Atwater
Anderson, P. D., 1893.....Waconia
Armstrong, Augustus, 1893.....Albert Lea
Ames, E. D., 1893.....Lyle
Asher, M., 1893.....Myrtle
Andrews, Gen'l A. A., 1893.....St. Paul
Atwood, P. H., 1892.....Maple Hill, Ia
Allyn, Mrs. Fidelia, 1892.....Red Wing
Anderson, A. J., 1892.....Franklin
Bunnell, M. C., 1893.....Newport
Bass, J. G., 1893.....Hamline
Busch, Fred., 1893.....Richfield
Barrett, J. O., 1893.....Brown's Valley
Bost, A. A., 1893.....Excelsior
Brown, C. F., 1893.....St. Peter
Buck, Daniel, 1893.....Mankato
Bonniwell, Mrs. Annie, 1893.....Hutchinson
Burnett, Frank, 1892.....Belmont, Manitoba
Beardsley, B. F., 1893.....Excelsior
Baston, J. J , 1893.....St. Louis Park
Brown, F. S., 1893.....Tracy
Brackett, A. H., 1893.....Minneapolis
Brown, Wm., 1893.....Sand Coulee, Montana
Bryson, Mrs. A., 1892.....Owatonna
Buck, Willard, 1893.....Alexandria
Barrett, N. W., 1893.....Clearwater
Bisbee, John, 1893.....Madelia
Bush, J. E., 1892.....Truly, Montana
Bussee, H. F., 1893.....Minneapolis
Brooks, J. T., 1893.....Renville
Benedict, C. L., 1893.....Mankato
Biddle, W. H., 1893.....Lake City
Bradford, Alfred, 1893.....Excelsior
Blackwell, Mrs. J. W., 1893.....Alexandria
Bofferding, Wm. H., 1893.....127 Plymouth Ave., Minneapolis
Buttermore, R. H., 1893.....Lake City
Brown, Mrs. J. H., 1893.....Lac qui Parle
Black, T. T., 1893.....Jefferson Island, Montana
Beardsley, W. G., 1893.....St. Louis Park

Bittman, John, 1893.....Park Rapids
Blair, C. L., 1892.....St. Charles
Benson, Mrs. G. F., 1892.....Lake City
Cook, M. W., 1893.....Rochester
Cutler, M., 1893.....Sumter
Cuzner, E. A., 1893.....Essex and 27th Aves. S. E., Minneapolis
Cuzner, Mrs. E. A., 1893.....Essex and 27th Aves., S. E., Minneapolis
Crandall, Ethan, 1892.....Sumter
Corlett, J. E., 1892.....Farmersburg, Iowa
Chandler, E. M., 1893.....Minneapolis
Cook, Dewain, 1893.....Windom
Crosby, F. M., 1893.....Hastings
Cross, Mrs. E., 1893.....Sauk Rapids
Crane, H. L., 1893.....Excelsior
Collar, E. L., 1893.....Vermillion, South Dakota
Chandler, Gilbert, 1893.....Minneapolis
Crooker, Mrs. E. B., 1893.....Minneapolis
Cummins, J. R., 1893.....Washburn
Cutts, E. J., 1893.....Howard Lake
Caswell, A. M., 1892.....Litchfield
Case, J. F., 1892.....Eau Claire, Wisconsin
Craig, H. E., 1893.....1631 Wesley Ave., St. Paul
Curtis, M. M., 1892.....Marshall
Church, C. H., 1892.....Owatonna
Carleson, C. T., 1892.....927, 14th Street S., Minneapolis
Curran, W. H., 1892.....406 Lumber Exchange, Minneapolis
Crawford, Matthew, 1893.....Cuyahoga Falls, Ohio
Cutler, S., 1893.....Excelsior
Clarke, F. H., 1893.....23 Chamber of Commerce, Minneapolis
Clarke, N. B., 1893.....St. Cloud
Connor, Edward, 1893.....Humboldt, Iowa
Cooper, A. K., 1893.....Winona
Canright, J. E., 1893.....Fairmont
Cannon, C. H., 1892.....St. Anthony Park
Day, Ditus, 1893.....Farmington
Day, L. E., 1893.....Farmington
Doughty, J. Cole, 1893.....Lake City
Danforth, Wm., 1893.....Red Wing
Dennis, A. B., 1893.....Cedar Rapids, Iowa
Dick, Francis, 1893.....Afton
Deletraz, G. F., 1892.....Fort Benton, Montana
Dobson, Wm., 1893.....Minnetonka Mills
Doudna, J. M., 1893.....Alexandria
Dunnewold, John, 1893.....Duelm
Dobbyn, W. R., 1893.....care Progressive Age, Minneapolis
Dance, W. G., 1893.....400, 9th St. S.E., Minneapolis
Dampier, Wm., 1893.....St. Paul
Doughty, C. M., 1893.....Heron Lake
Dawson, Chas., 1893.....400 Sibley St., St. Paul
Dexter, Chas., 1892.....Mound City
Evans, T. R., 1893.....Le Sueur

Eklof, John, 1893.....Cokato
Evans, J. P. V., 1893.....Twin Valley
Evans, D. E., 1892.....South Bend
Fuller, G. W., 1893.....Litchfield
Frisselle, Dr. M. M., 1893.....Eureka
Fiedler, F. H., 1893.....Fergus Falls
Furber, J. T., 1893.....Madelia
French, W. S., 1893.....Slayton
Freund, J., 1893.....Blue Earth City
Ford, J. W., 1892.....Owatonna
Ford, F. E., 1892.....Glencoe
Fogg, F. A., 1893.....Sauk Rapids
Frenn, P. J., 1893.....Red Wing
Flagler, I. L., 1893.....Ossian, Iowa
Fiedler, M. J., 1893.....Perham
Fabel, Ed., 1892.....Hamburg
Fleming, H. F., 1892.....1113 Pioneer Press Bldg, St. Paul
Gray, J. S., 1893.....3900 Portland Ave., Minneapolis
Gustafson, Charles, 1893.....Worthington
Green, Prof. S. B., 1893.....St. Anthony Park
Gilfillan, C. O., 1892.....Morgan
Giles, G. W., 1893.....Zumbrota
Goertz, H. P., 1892.....Mountain Lake
Gibbs, F. H., 1893.....St. Anthony Park
Goodell, Mrs. H. M., 1892.....Owatonna
Gregg, Prof. O. C., 1893.....1425, 6th St. S. E., Minneapolis
Gilman, J. B., 1893.....409, 8th St. S.E., Minneapolis
Gergen, N. B., 1893.....Hastings
Gray, R. R., 1893.....Lake City
Gordon, Mrs. Drusilla A., 1893.....Long Lake
Goodell, C. L., 1893.....Barnum
Godley, J. G., 1893.....Albert Lea
Goodell, J. S., 1893.....Barnum
Grinnell, W. H., 1893.....Bay Lake
Gullick, Lewis, 1892.....Springfield
Griffin, Lester, 1892.....River Falls, Wis
Gardner, A. V., 1892.....Hastings
Hawkinson, Charles, 1893.....Box 495, Minneapolis
Hall, Prof. C. W., 1893.....Minneapolis
Hillman, S. D., 1892.....Minneapolis
Heideman, C. W. H., 1893.....New Ulm
Hagen, O. J., 1893.....Hendrum
Holmes, G. W., 1892.....Glencoe
Hays, Prof. W. M., 1893.....Fargo, N. D.
Hurt, O. J., 1893.....Island Lake
Hansen, Ivar, 1893.....816, 11th Av. N., Minneapolis
Hunter, John, 1893.....Anoka
Harrington, D. F., 1892.....Adrian
Heins, H. H., 1893.....Lydia
Hawks, Samuel, 1892.....Waseca
Haupt, F. S., 1893.....Albert Lea
Hadskis, G. H., 1892.....Winnipeg, Manitoba

Haseltine, E. W., 1893.....Grand Forks, N. D.
Hauge, L. J., 1892.....Elbow Lake
Holmes, W. H., 1892.....Davenport, Iowa
Hunter, H. R., 1893.....Sioux Falls, S. D.
Hillstrom, Theodore, 1893.....East Union
Hanson, J. P., 1892.....Hastings
Hanson, M. C., 1892.....Hutchinson
Haugen, A. H., 1892.....Estherville, Iowa
Huntington, G. E., 1892.....Eau Claire, Wis.
Heinecke, J., 1893.....Buffalo Lake
Hazelton, D. C., 1893.....Nichols
Hyland, Daniel, 1893.....Rosemont
Hogler, Fletcher, 1893.....Pine Island
Hanson, John, 1893.....Skjold, S. D.
Hamlin, Alonzo, 1893.....Spring Valley
Hanson, Ludwig M., 1893.....Lemond
Imerson, Mrs. Cynthia A., 1892.....St. Paul
Jessup, G. H., 1893.....Tracy
Jones, Aaron, 1893.....Canova, S. D.
Jefts, Mrs. Charles, 1892.....Owatonna
Johnson, A. A, 1893.....Winnebago City
Jacobson, S., 1893.....Tordenskjold
Jenson, Lewis, 1893.....Grand Rapids
Jones, G. C., 1893.....Watertown, S. D.
Johnson, C. J., 1893.....Stordon
Johnson, J. G., 1893.....Gossen
Jellison, G. J., 1892.....Lodi, Wis.
Johnson, Rufus, 1892.....Winnebago City
Kramer, J. C., 1893.....La Crescent
Knapheide, Rudolph, 1893.....St. Paul
Kenney, S. H., 1893.....Morristown
Kennedy, Mrs. A. A., 1893.....Hutchinson
Kilbourne, F. M., 1893.....Lakeville
Keel, R. C., 1893.....Rochester
Kerr, T. P., 1893.....Milaca
Kneeland, N. C., 1892.....Plainview
Kimball, F. W., 1893.....Austin
Kenning, Charles, 1893.....Bird Island
Kennedy, J. W., 1893.....Lake City
Kearney, Charles, 1893.....Grand Rapids
Koalska, Joseph, 1893.....391 Rice St., St. Paul
Kleinke, H. A., 1893.....Albert Lea
Lyons, Wm., 1893.....2924 Clinton Av., Minneapolis
Lyons, Miss Mattie, 1892.....2924 Clinton Av., Minneapolis
Lord, O. M., 1893.....Minnesota City
Lory, H. A., 1892.....Maple Ridge
Longsdorf, W. H., 1893.....Lake City
Long, A. G., 1892.....Excelsior
Lyman, H. M., 1893.....Excelsior
Lafot, Edward, 1893.....Lakefield
Ludlow, H. J., 1893.....Worthington
Lynne, Lars, 1892.....Elbow Lake

Lucknow, Charles, 1892.....Minneapolis
Lehman, Sr., Charles, 1893.....Mound Prairie
Lovering, H. A., 1893.....Maple Plain
Lano, Albert, 1893.....Madison
Leuman, W. D., 1893.....Grand Rapids
Lewis, Rob't, 1893.....Caledonia
Lawson, Wm., 1893.....614 Westminster st., St. Paul
Leonard, H. C., 1892.....1527 N. 6th st., Minneapolis
McKinstry, A. W., 1893.....Faribault
McKellip, C. D., 1892.....Faribault
Mills, L. D., 1893.....Garden City
Mackintosh, Wm., 1893.....Langdon
Mackintosh, R. S., 1893.....Langdon
Merrill, D. D., 1893.....St. Paul
Moyer, L. R., 1893.....Montevideo
May, L. L., 1893.....St. Paul
Morris, W. H., 1892.....Excelsior
Murray, J. W., 1893.....Excelsior
Malmquist, Gust., 1892.....Fair Oaks, Minneapolis
Myers, D. E., 1893.....St. Cloud
Mills, Fred., 1893.....Camden Place, Minneapolis
Morgan, R. C., 1892.....Goodhue
McRastie, Mrs. J. H., 1892.....Owatonna
Moor, G. W., 1893.....Lidgerwood, N. D.
Marston, Perrin, 1892.....Winnebago City
Malcolm, H. W., 1893.....Minneapolis
Mitchell, Timothy, 1892.....Hastings
Marschall, Peter, 1893.....Hastings
Mason, J. R., 1893.....Forest Mills
Moore, R. H., 1893.....Lake City
McConnell, W. W. P., 1893.....Mankato
Miller, Geo. R., 1893.....Richland
Mainz, Simeon, 1893.....Hastings
Morrisee, G. F., 1893.....Alexandria
Mitchell, M. M., 1893.....care Crane Co., Minneapolis
Morrison, Mrs. Dorilus, 1893.....Villa Rosa, Minneapolis
McNelly, John, 1893.....Wilmington
Meacham, A. S., 1892.....Adrian
Norquist, John, 1892.....Red Wing
Norswing, K. B., 1893.....Holden
Nordquist, O. A., 1893.....St. Paul
Noehl, John, 1893.....Kasson
Neil, O. H., 1892.....Holden
Nichols, C. P., 1892.....Northfield
Olson, P. M., 1893.....Bratsberg
Ofstedahl, Rev. N. A., 1892.....Holden
Ofstedahl, Rev. A., 1892.....Fertile
Opjorden, O. K., 1893.....Milan
Oxford, Wm., 1893.....Freeburg
Porter, J. F., 1893.....Red Wing
Parker, W. L., 1893.....Farmington
Puffer, Dr. F. L., 1893.....Bird Island

Pendergast, Prof. W. W., 1893.....Hutchinson
Pennell, Prof. C. S., 1893.....St Anthony Park
Pond, E. R., 1893.....Bloomington
Powell, F. M., 1893.....Glenwood, Iowa
Powell, M. E., 1892.....St. Peter
Plants, D. V., 1893.....Long Lake
Parry, C. M., 1892.....523 Guaranty Loan Building, Minneapolis
Pracna, F. J., 1893.....117 Main St. S. E., Minneapolis
Prescott, G. H., 1892.....Albert Lea
Perry, P. H., 1892.....Excelsior
Payne, C. E., 1892.....Dexter
Peschong, Peter, 1892.....Odebolt, Iowa
Purchase, J. R., 1892.....Minneapolis
Peterson, J. A., 1893.....Fair Oaks, Minneapolis
Peart, T., 1892.....Mankato
Pratt, F. F., 1893.....Bethel
Parks, J. S., 1893.....Pleasant Mounds
Pratt, Jas., 1893.....Richfield
Page, Prof. C. E., 1893.....Windom
Pye, S. M., 1893.....Faribault
Pell, Wm A., 1893.....Northfield
Payne, S. D., 1893.....Kasota
Patterson, Jas., 1892.....Albany, Wis.
Pribyl, Rev. F. J., 1892.....Weseley
Peterson, Peter, 1892.....Elbow Lake
Richardson, S. D., 1893.....Winnebago City
Rogers, Dr. A. C., 1892.....Faribault
Richardson, W. F., 1893.....Winnebago City
Redpath, Thomas, 1893.....Minneapolis
Rice, W. C., 1892.....439 Clinton Ave., St. Paul
Ridley, John, 1892.....Burr Oak, Iowa
Rathbone, W. B., 1893.....Kedron
Rundell, J. W., 1893.....Pony, Montana
Rundell, G. A., 1893.....Pony, Montana
Reinold, Mrs. H. C., 1893.....43, 8th St. S., Minneapolis
Ryan, John, 1893.....Canton
Somerville, Wm., 1892.....Viola
Solem, Rev. O. A. Th., 1893.....Halstad
Strandwold, Ole, 1893.....Trysil, Dakota
Scott, W. G., 1893.....Winnepeg, Manitoba
Sampson, C. W., 1893.....Excelsior
Sampson, J. A., 1893.....Excelsior
Street, A. H., 1893.....Alden
Sargent, C. A., 1893.....Red Wing
Sundberg, C. A., 1893.....Worthington
Sharp, Dr. L. N., 1893.....Minneapolis
Somerville, L. E., 1893.....Viola
Sewall, Mrs. Ida C., 1893.....St. Anthony Park
Shaubut, Mrs. J. J., 1892.....Cheney, Kansas
Sackett, D. P., 1892.....Fairmont
Smith, G. H., 1893.....Long Lake

Scherlie, H. A., 1893.....Dundee
Sexton, C. W., 1893.....13 Washington Av. N., Minneapolis
Stevenson, A. P., 1893.....Nelson, Manitoba
Simmons, F. A., 1893.....Hastings
Seeger, F. B., 1893.....Cannon Falls
Siebenaler, Mathias, 1893.....Hastings
Sprague, A. D., 1893.....Caledonia
Selden, H E., 1893.....41 S. 11th St., Minneapolis
Schmauss F. J., 1893.....Lake City
Strom, W. B., 1893.....Hector
Smith, D. F., 1892.....St. Charles
Slingerland, T. S., 1892.....Kasson
Smith, Prof. C. D., 1893.....St. Anthony Park
Schmidt, Theodore, 1892.....Caledonia
Sandrock, Wm., 1893.....Money Creek
Sorkness, H. O., 1892.....St. Anthony Park
Smith, W. G., 1892.....St. Anthony Park
Stene, A. E., 1892.....St. Anthony Park
Sheldon, J. T., 1892.....Rochester
Secor, Willard, 1892.....Winnebago City
Savage, J. H., 1893.....Guaranty Loan Building, Minneapolis
Samson, Mrs. Louise, 1893.....2, 11th St. S., Minneapolis
Smith, Chas. H., 1893.....Excelsior
Scranton, E., 1893.....Montrose
Snoke, M. H., 1893.....Long Lake
Stewart, E. C., 1893.....Barnum
Shogren, Erick, 1893.....Red Wing
Turnbull, John, 1893.....La Crescent
Taylor, Barnett, 1893.....Forestville
Terry, Alfred, 1893.....Slayton
Thayer, Mrs. P. A., 1893.....Sauk Rapids
Trenham, N. J., 1892.....Alexandria
Turner, John, 1893.....Shakopee
Trout, Henry, 1892.....Farmington
Thom, R. C., 1893.....Owatonna
Terrill, H. A., 1892.....Shelden, Iowa
Thompson, Harvey, 1892.....Windom
Taughtes, M. C., 1892.....Hastings
Tonning, O. A., 1892.....Taopi
Taft, A. R., 1892.....Hampton
Theilmann, C., 1893.....Theilmanton
Tingley, W. J., 1893.....Stillwater
Talbot, Thomas, 1893.....Long Lake
Underwood, J. M., 1893.....Lake City
Underwood, Mrs. Anna B., 1893.....Lake City
Urie, Wm., 1893.....2520 Bryant Ave, N, Minneapolis
Varholdt, O. O., 1893.....Lawndale
Wachlin, Wm., 1893.....Faribault
Wedge, Clarence, 1893.....Albert Lea
Wilcox, L. H., 1893.....Hastings
Wickersheim, W. J., 1893.....Idlewild

Weston, G. A., 1893.....Faribault
Woehle, B., 1892.....Iona
Williford, Wm., 1893.....Canton
Ware, Eugene, 1893.....Owatonna
Wilkinson, C. B., 1893.....Owatonna
Wood, Joseph, 1893.....Windom
Wentworth, David, 1892.....Hastings
Willis, F. D., 1893.....13 Chamber of Commerce, St. Paul
Williford, F. W., 1893.....Canton
Winter, E. J., 1893.....Jordan
Widmoyer, W. S., 1893.....Dresbach
Wentworth, Dr. S. S., 1893.....629, 6th Ave. S., Minneapolis
Walker, J. C., 1893.....Rose Creek
West, J. P., 1893.....Hastings
Williams, Prof. T. A., 1893.....Brookings, S. D.
Winkjer, J. G., 1893.....Garfield
Williams, Fred., 1893.....Barnum
Yancey, B. C., 1893.....Edina Mills
Zenner, Peter, 1892.....Caledonia

LIFE MEMBERS.

Fee, $10.00. (May be paid in two annual installments.) Life members are entitled to *full sets* of back reports, except one or two volumes, exhausted.

Herzog, Philip.....Chowen
Manda, W. A.....Short Hills, N. J
Nagel, Eggert.....1118 W. Lake St., Minneapolis
Wheaton, D. T.....Morris
Harris, F. I.....La Crescent
Boxell, J. W.....85 W. Congress St., St. Paul
Stager, Mrs. Jennie.....Sauk Rapids

HONORARY MEMBERS.

HONORARY LIFE MEMBERS.

Budd, Prof. J. L.....Ames, Ia
Bowen, Mrs. Jas.....Minneapolis
Brand, O. F.....Faribault
Coleman, Hon. N. J.....St. Louis, Mo
Cleveland, Prof. H. W. S.....Minneapolis
Corp, Sidney.....Hammond
Dartt, E. H. S.....Owatonna
Elliot, Wyman.....Minneapolis
Ford, L. M.....San Diego, Cal
Grimes, J T.....3209 Nicollet Ave., Minneapolis
Gideon, P. M.....Excelsior
Gibbs, Jr., Oliver.....Ramsey, S. D
Gould, F. G.....Excelsior
Harris, J. S.....La Crescent
Lacey, Chas. Y.....Fort Benton, Mon
Luedloff, Chas.....Carver
Latham, A. W.....Excelsior
Manning, J W.....Boston, Mass
Manning, Mrs. J. W.....Boston, Mass
Mendenhall, R. J.....Minneapolis
Manning, Miss Sara M.....Lake City
Peffer, Geo. P.....Pewaukee, Wis
Plumb, J. C.....Milton, Wis
Phoenix, F. K.....Delavan, Wis
Paist, Mrs. Wm.....Hersey
Pearce, M.....Chowen
Peterson, Andrew.....Waconia
Robertson, Col. D. A.....St. Paul
Smith, J. M.....Green Bay, Wis
Stevens, Col. J. H.....Minneapolis
Smith, Truman M.....San Diego, Cal
Sias, A. W.....Pueblo, Cal
Smith, C. L.....Minneapolis
Sargeant, Mrs. H. B.....Lake City
Somerville, Wm.....Viola
Tuttle, A. C.....Baraboo, Wis
Tilson, Mrs. Ida E.....West Salem, Wis
Van Cleve, Mrs. C. O.....603 SE 5th St., Minneapolis
Wilcox, E.....La Crosse, Wis

HONORARY MEMBERS FOR FIVE YEARS.

Prof. W. H. Ragan, elected 1889.....Greencastle, Ind
Mrs. V. H. Campbell, elected 1889.....Evansville, Wis
A. J. Phillips, elected 1889.....West Salem, Wis
Elmer Reeves, elected 1889..... Waverly, Ia
Thos. Frankland, elected 1889.....Stonewall, Man
C. C. Bell, elected 1889.....Booneville, Mo
Frank Burnett, elected 1890.....Glenboro, Man
Mrs. Frank Burnett, elected 1890.....Glenboro, Man
Edson Gaylord, elected 1891.....Nora Springs, Ia
Prof. C. B. Waldron, elected 1891.....Fargo, N. D
M. A. Thayer, elected 1891..... Sparta, Wis
G. J. Kellogg, elected 1891.....Janesville, Wis
J. B. Mitchell, elected 1892.....Cresco, Ia
C. H. Hamilton, elected 1892.....Ripon, Wis

NURSERYMEN AND FLORISTS WHO ARE MEMBERS OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

NURSERYMEN.

S. D. Richardson.....Winnebago City
J. O. Barrett.....Browns Valley
O. F. Brand.....Faribault
M. C. Bunnell.....Newport
P. M. Gideon.....Excelsior
J. S. Harris & Son (small fruits).....La Crescent
J. M. Underwood (Jewell Nursery Co.).....Lake City
M. Pearce.....Chowen
Geo. P. Peffer.....Pewaukee, Wis
C. L. Smith.....Minneapolis
A. C. Tuttle.....Baraboo, Wis
A. A. Bost.....Excelsior
J. C. Kramer.....La Crescent
F. M. Kilbourne.....Lakeville, Dakota Co
M. W. Cook (small fruits).....Rochester
F. B. Seager.....Cannon Falls
Chas. Hawkinson.....Box 495, Minneapolis
E. J. Cutts.....Howard Lake
Clarence Wedge.....Albert Lea
G. W. Fuller.....Litchfield
E. W. Haseltine.....Grand Forks, N. D
John Eklof.....Cokato
L. D. Mills.....Garden City
R. C. Keel.....Rochester
J. P. Andrews.....Faribault

FLORISTS.

F. G. Gould.....Excelsior
R. J. Mendenhall.....18th St. and 1st Av. S., Minneapolis
Gust. Malmquist.....Fair Oaks, Minneapolis
E. Nagel (E. Nagel & Co.).....1118 West Lake St., Minneapolis
Wm. Wachlin.....Faribault
A. M. Caswell.....Litchfield
L. L. May (L. L. May & Co.).....St. Paul
M. E. Powell.....St. Peter
A. D. Roe.....Stillwater
O. A. Nordquist.....Oakland Cemetery, St. Paul
W. A. Manda.....Short Hills, N. J

LIST OF PAPERS ADVERTISING THE WORK OF THE SOCIETY IN 1892.

The following newspapers run a notice gratuitously, for from one to three months, calling the attention of the public to the work of our society. Most of the newspapers solicited complied at once with our request.

Todd County Argus, Long Prairie.
Lincoln County Journal, Tyler.
Tribune, Mazeppa.
Banner, Royalton.
Saturday Evening Spectator, Minneapolis.
Republican, Tracy.
Foot Prints, Brown's Valley.
Argus, Shakopee.
Times, St. Charles.
Express, Mantorville.
Hubbard County Enterprise, Park Rapids.
Herald, Sauk Center.
Republican, Faribault.
Post, Rochester.
Age, Aitkin.
Republican, Red Wing.
Republican, Kasson.
Argus, Red Wing.
Douglas County News, Alexandria.
Chisago County News, Taylors Falls
Journal, Caledonia.
Advance, Waterville.
Leader, Kenyon.
The Peoples' Press, Owatonna.
Star, Rushford.
Grant County Farmer, Ashby.
Record, Pine Island.
Record, Dodge Center.
News, Lake Benton.
Carver County News, Waconia.
World, Staples.
Tribune, Farmington.
Sun, Hokah.
News, Le Sueur.
Journal Press, St. Cloud.
Leader, Hutchinson.
Graphic Sentinel, Lake City.
Democrat, Springfield.
New Era, St. Vincent.
Journal, Fergus Falls.
Gazette, Slayton.
News, Canby.
The Great West, St. Paul.
Sentinel, Dawson,
News, Brownsville.
Press, Atwater.
Times, Monticello.
Post, Two Harbors.
Ugeblad, Fergus Falls.
Journal, Owatonna.
Sun, Morris.
Journal, Verndale.
Herald, Winona.
Hector Union, Bird Island.
News, Winthrop.
Eagle, Delano.
Breeder and Farmer, Howard Lake.
Enterprise, Arlington.
Journal, Buffalo.

OFFICERS

OF THE

MINNESOTA STATE AGRICULTURAL SOCIETY,

FOR THE YEAR 1893.

PRESIDENT.

COL. J. H. STEVENS.....Minneapolis

FIRST VICE-PRESIDENT.

ED. WEAVER.....Mankato

SECOND VICE-PRESIDENT.

J. H. MURPHY.....St. Paul

SECRETARY AND GENERAL MANAGER.

W. F. CROSS.....Red Wing

TREASURER.

A. B. MOFFATT.....Le Sueur

BOARD OF MANAGERS.

CLARKE CHAMBERS.....Owatonna
C. N. COSGROVE.....Le Sueur
WM. M. LIGGETT.....Benson
J. J. FURLONG.....Austin
E. W. RANDALL.....Morris
J. H. LETSON.....Alexandria

On account of the Columbian Exposition no State Fair will be held in 1893.

CONSTITUTION

OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY.

ARTICLE I.

NAME.

This society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.

OBJECT OF THE SOCIETY.

The object of this society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees and other productions in horticulture as are adapted to the soil and climate of Minnesota.

ARTICLE III.

MEMBERSHIP.

Any person may become a member by paying to the secretary or treasurer an annual fee of one dollar, or a life member by the payment of ten dollars; provided that a life member may pay the fee of ten dollars in two equal annual payments of five dollars each.

Local or county horticultural societies and kindred organizations may become auxiliary to this society by sending three delegates to the annual winter meeting, who shall be entitled to all the rights and privileges of membership upon furnishing to the secretary of this society a list of members of their society and a report of the proceedings thereof.

Honorary members, for a time stated or for life, may be elected at any annual meeting by a two-thirds vote of the society.

ARTICLE IV.

OFFICERS.

Its officers shall consist of a president, one vice-president from each congressional district, a secretary, a treasurer, an executive committee of five, and a librarian.

ARTICLE V.

DUTIES OF PRESIDENT AND VICE-PRESIDENTS.

The president shall preside at and conduct all meetings of the society, and deliver an annual address; and in his absence the vice-presidents, in their order, shall perform the same duties. They shall also have a general supervision of the horticultural interests in their respective districts, and make a written report to the society at its annual winter meeting; in consideration for which the society shall pay their traveling expenses to the same.

ARTICLE VI.

THE SECRETARY.

The secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all moneys received from members or otherwise to the treasurer on his receipt; receive and answer all communications addressed to the secretary; establish and maintain correspondence with all local, county, district and state horticultural societies, and secure by exchange their transactions, as far as possible; aid the president as an executive officer in the dispatch of business relating to the meetings of the society; take notice of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which, with its approval, shall become part of its transactions of the current year.

ARTICLE VII.

THE TREASURER.

The treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the president, countersigned by the secretary. He shall make up a report of all

the receipts and disbursements of the society and present the same at the annual winter meeting, or at any other time when called upon to do so by the executive committee. He shall give bonds in such sums as the society may direct, to be approved by the president and secretary, and the bond when so approved shall be filed with the state auditor.

ARTICLE VIII.

ELECTION OF OFFICERS.

The officers shall be elected separately and annually by ballot, and hold their offices until their successors are elected.

ARTICLE IX.

MEETINGS OF THE SOCIETY.

The society shall hold an annual session on the second Tuesday of January, and other meetings at such time and place as the society may direct.

ARTICLE X.

THE LIBRARIAN.

The librarian shall have charge of the library and report its condition at each annual meeting.

ARTICLE XI.

AMENDMENTS.

By-law sand alterations of the constitution, for the purpose of meeting the future wants of the society, may be enacted by a vote of two-thirds of the members present at any regular annual meeting, and on one day's notice of the same being given.

BY-LAWS.

1. The president at each annual meeting of the society shall appoint a general fruit committee, consisting of two members from each congressional district in the state; and it shall be the duty of each member to make a written report annually upon the fruit crop, and a limited list of fruits best adapted for general cultivation in their respective districts.

2. The president, secretary and treasurer shall be members *ex officio* of the executive committee, who shall have charge of all matters pertaining to the interest of the society.

3. The executive committee may call a meeting of the society at any time they may deem advisable, giving at least thirty days' notice through the public press.

4. The executive committee shall appoint a committee on seedlings, on nomenclature, on forestry, on fruit blossoms, on Russian apples, on gardening, on small fruits and on floriculture.

5. The five members of the executive committee, not including the president, secretary or treasurer, shall be a committee on finance, and it shall be their duty to audit all bills before they shall be ordered paid by the president and secretary.

6. The executive committee shall see that a program is issued for each meeting of the society, at least one month before the winter meeting and ten days before the summer meeting.

7. Every member shall be entitled to one copy of the transactions as often as published, on which postage shall be paid; but in distribution of all other copies the parties receiving the same shall pay the postage. Where several copies are sent to auxiliary societies it shall be discretionary with the secretary to pay the freight.

8. *Quorum.*—A quorum shall consist of nine members of the society or a majority of the executive committee.

RULES FOR NAMING FRUIT.

RULE 1. The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit.

RULE 2. The society reserves the right, in case of long, inappropriate or otherwise objectionable names, to shorten, modify, or wholly change the same, when they shall occur in its discussions or reports; and also to recommend such changes for general adoption.

RULE 3. The names of fruits should preferably express, as far as practicable, by a single word, the characteristics of the variety, the name of the originator or the place of its origin. Under no ordinary circumstances should more than a single word be employed.

RULE 4. Should the question of priority arise between different names for the same variety of fruit, other circumstances being equal, the name first publicly bestowed will be given the precedence.

RULE 5. To entitle a new fruit to the award or commendation of the society, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality or combination of qualities in a higher degree than any previously known variety of its class and season.

RULE 6. A variety of fruit having been once exhibited, examined and reported upon as a new fruit by a committee of the society, will not thereafter be recognized as such, so far as subsequent reports are concerned.

Suggestion:—That Rule 6 shall not be construed to mean that a new seedling variety, having been exhibited, examined and reported upon, shall not be eligible to compete for any special prize offered by this society that requires two or more exhibitions before the final award is made.

FRUIT LIST, 1893.

Apples: Hardiest varieties for general cultivation in the southern one-half the state: Oldenburg and Hibernal (or Lieby). In southern one-fourth of the state: Wealthy, Longfield and Tetofsky. For trial: Charlamoff, Christmas, Borovinka and No. 245.

Native Seedling Apples: Okobena, Peerless and Patten's Greening.

Crabs and hybrids, for general cultivation: Virginia, Martha, Early Strawberry, Whitney and Briar Sweet. For trial south of the 46th parallel: Martha, Beecher's Sweet, Arlington.

Grapes, for general cultivation: Concord, Delaware, Worden, Moore's Early, Janesville, Brighton and Lady. For trial: Moore's Diamond.

Strawberries: Warfield, Crescent, Haverland, fertilized by Wilson, Depew, Downer's Prolific, Jessie and Beder Wood.

Red raspberries: Turner, Cuthbert, Marlboro and Brandywine.

Raspberries: Doolittle, Hayes, Nemaha and Gregg.

Blackberries: Ancient Briton, Snyder and Stone's Hardy.

Currants: Red Dutch, White Grape, Victoria, Long Bunch Holland, Prince Albert and Stewart.

Gooseberries: Houghton and Downing.

Dwarf Juneberry.

Plums: Desota, Rolling Stone, Forest Garden, Wolf (the Wolf to be grown on native stocks) and Weaver. For trial: Ocheeda and Cheney.

Sand Cherry.

PROCEEDINGS OF EXECUTIVE COMMITTEE.

RECORD OF MEETING HELD IN THE LIBRARY IN MINNEAPOLIS, FEBRUARY 16, 1892.

The meeting was called to order by the chairman, Wyman Elliot, at 2 P. M., all the members being present.

The annual standing committees were appointed.

It was decided to leave the arrangements for the summer meeting with the president and secretary of the society, and Prof. S. B. Green.

The following committee was appointed on the revision of the premium list for the state fair: J. M. Underwood, S. B. Green, J. S. Harris and A. W. Latham.

A committee consisting of A. W. Latham, J. M. Underwood and S. B. Green was appointed to decide upon a plan for the distribution of small fruit plants, as offered by M. A. Thayer, J. S. Harris and others.

The following accounts were audited:

No. 15, J. H. Savage, for reporting meeting	$76.00
No. 16, Dewain Cook, expenses of Vice-President	3.70
No. 17, O. F. Brand, expenses at Ex-Com. meeting	5.54
No. 18, J. S. Harris, expenses at Ex-Com. meeting	8.15
No. 19, J. M. Underwood, expenses at Ex-Com. meeting	3.00
No. 20, L. H. Wilcox, expenses at Ex-Com. meeting	2.15
No. 21, E. H. S. Dartt, expenses delegate to Wis. Hort. Soc'y	14.00

Adjourned *sine die*.

A. W. LATHAM, Secretary.

RECORD OF MEETING HELD AT THE STATE CAPITOL, MAY 4, 1892.

The meeting convened upon call of the chairman at 10 A. M., all the members being in attendance except O. F. Brand.

The committee proceeded to examine and revise the estimates prepared by the secretary for the horticultural exhibit at the World's Fair. A committee consisting of J. M. Underwood, Wyman Elliot and Prof. S. B. Green was appointed as an advisory committee to act in concert with the superintendent of the horticultural exhibit in preparing this display.

It was decided to hold the summer meeting at Lake City at a date to be fixed by the president later.

At 2 P. M. the committee appeared before the World's Fair Commission to present the claims of horticulture in connection with the exposition.

Adjourned *sine die.*

A. W. LATHAM, Secretary.

RECORD OF MEETING HELD AT LAKE CITY, JULY 19, 1892.

All the members were present except L. H. Wilcox. L. P. Hunt, superintendent of the Minnesota exhibit at the World's Fair, met in conference with the committee in regard to the horticultural exhibit.

Without transacting any business the committee adjourned to meet at President Underwood's house at 8 A. M., July 20th.

A. W. LATHAM, Secretary.

RECORD OF MEETING HELD AT PRESIDENT UNDERWOOD'S OFFICE, IN LAKE CITY, JULY 20, 1892.

The matter of the horticultural exhibit at the World's Fair was canvassed, and the World's Fair committee was directed to appear before the World's Fair Commission August 4th for conference and further instruction.

The following resolution relating to the death of Mrs. E. D. Porter was adopted, and the secretary was requested to send a copy to Prof. Porter.

Resolved: That in common with his many friends in Minnesota, this society extend to Prof. E. D. Porter their earnest sympathy in the great and irreparable loss that has come to him in the death of his wife.

The committee adjourned till 1 P. M. Wednesday of the state fair week.

A. W. LATHAM, Secretary.

RECORD OF MEETING HELD AT THE STATE FAIR GROUNDS, SEPTEMBER 7, 1892.

All the members were in attendance.

Wyman Elliot and A. W. Latham were elected delegates to to the American Horticultural Society, meeting in Chicago the 28th inst.

The secretary was instructed to purchase a mimeograph for the use of his office.

It was decided to hold the next annual meeting of the society at Minneapolis. The president, secretary and chairman of the executive committee were authorized, at their discretion, to tender to the writers of papers from abroad their expenses while in attendance upon the meeting.

Adjourned to 1:30 p. m., Sept. 8th.

A. W. LATHAM, Secretary.

RECORD OF ADJOURNED MEETING HELD AT THE STATE FAIR GROUNDS, SEPT. 8, 1892.

Messrs. Elliot, Day, Harris, Brand and Latham were present.

The following bills were audited:—O. F. Brand, $3.32; Ditus Day, $8.11; J. S. Harris, $19.85.

The secretary was instructed to procure a seal for the use of the society.

A proposition was considered to assist in editing the Farmer's Annual, and referred to Wyman Elliot, S. B. Green and A. W. Latham with power to act.

Meeting adjourned, *sine die.*

A. W. LATHAM, Secretary.

RECORD OF MEETING HELD AT THE LUMBER EXCHANGE, MINNEAPOLIS, MINN., JAN. 11, 1893.

All the members were present.

The financial statements of the secretary and treasurer for the year ending Jan. 10, 1893, were examined and found correct, and the bill of Secretary A. W. Latham for the expenses of the office for the year ending Jan. 10, 1893 was ordered paid, $328.05.

Adjourned *sine die.* A. W. LATHAM, Secretary.

SUMMER MEETING.

NOTICE OF SUMMER MEETING.

The summer meeting of the Minnesota State Horticultural Society will be held Tuesday, July 19, 1892, at Lake City, Minn. The citizens of Lake City have kindly offered to entertain members of the Society and their ladies on that day and the following night.

This meeting, being held at the time of the annual Christian Convention at Rest Island, Lake City, those in attendance, by purchasing tickets to the Rest Island Convention, will be able to secure the usual reduced rates on most roads. Be sure and take a receipt from your station agent for fare going.

Carriages will meet members at the depot as they arrive Tuesday and convey them to the place of meeting.

The Society will hold a session immediately after dinner for the transaction of business, at which time short papers will be read and short talks given by the members present on subjects pertinent to the occasion.

Later in the day, the Society are to be tendered a drive by the citizens of Lake City, to take in points of interests about the city, including the Rest Island grounds, where very interesting meetings will be in progress.

The occasion of this meeting will be one of much social enjoyment as well as profit, and it is hoped a large number of the members may be in attendance.

Those expecting to be present and to receive the hospitalities offered, are requested to notify J. W. Kennedy, chairman of entertainment committee, Lake City, Minn., of the fact several days beforehand.

J. M. UNDERWOOD, President,
Lake City.

A. W. LATHAM, Secretary,
Excelsior.

PREMIUM LIST.

[Articles exhibited must be grown by the exhibitor.]

FLOWERS.

Collection of cut flowers	$5.00	$3.00
Collection of cut roses	3.00	2.00
Collection of cut pansies	3.00	2.00
Collection of cut carnations	3.00	2.00
Floral design	5.00	3.00
Hand bouquet	2.00	1.00

FRUITS.

Raspberries.—Collection of not less than three named varieties, one quart each	$3.00	$2.00
Largest fruit of any variety, one quart	2.00	1.00
Minnesota seedling, not before exhibited	2.00	1.00
Strawberries.—Same as for raspberries.		
Blackberries.—Same as for raspberries.		
Currants.—Same as for raspberries.		
Gooseberries—Same as for raspberries.		

VEGETABLES.

Collection, not less than six kinds	$3.00	$2.00
Asparagus, three bunches	1.00	.50
Beets, six	1.00	.50
Carrots, six	1.00	.50
Onions, six	1.00	.50
Radishes, six	1.00	.50
Turnips, six	1.00	.50
Pieplant, six stalks	1.00	.50
Lettuce, six heads	1.00	.50
Cabbage, three heads	1.00	.50
Cauliflower, three heads	1.00	.50
Green peas, half peck	1.00	.50
String beans, half peck	1.00	.50
New potatoes, half peck	1.00	.50
Cucumbers, six	1.00	.50
Summer squash, six	1.00	.50

RULES.

All exhibits must be in place by 1 p. m. The awarding committee will have power to recommend special premiums on seedlings and articles of special merit, fruits, flowers or vegetables, not provided for in the schedule of premiums. *Premiums will not be awarded on articles unworthy of exhibition, even if there is no competition.*

Competition will be open to all, but the annual membership fee of one dollar will be deducted from premiums awarded to persons who are not members of the society.

LIST OF PREMIUMS AWARDED AT THE SUMMER MEETING

FLOWERS.

	Premium.	Amt.
Collection of cut flowers	First	$5.00—E. Nagel & Co
Collection of carnations	First	3.00—E. Nagel & Co
Collection of cut roses	First	3.00—E. Nagel & Co.
Hand bouquet	Second	2.00—E. Nagel & Co.
Floral design	First	5.00—E. Nagel & Co.
Collection of cut pansies	First	3.00—Mrs. J. Allyn.
Collection of cut pansies	Second	2.00—Miss M. Lyons.
Floral design	Second	3.00—Mrs. J. Allyn.
Hand bouquet	First	2.00—Miss M. Lyons.
Hand bouquet	Third	1.00—Mrs. J. Allyn.
Collection of cut flowers	Second	3.00—Miss M. Lyons.
Collection of hollyhocks	First	3.00—Wyman Elliot.

FRUIT.

GOOSEBERRIES—		
Houghton	First	$2.00—Wyman Elliot.
Industry	First	2.00—Wyman Elliot.
Houghton	Second	1.00—Nels. Anderson.
RASPBERRIES—		
Collection of raspberries	First	3.00—J. F. Case.
Doolittle	First	2.00—Nels. Anderson.
Turner	First	2.00—Nels. Anderson.
Marlboro	First	2.00—J. F. Case.
CURRANTS—		
Red Dutch	First	2.00—Wyman Elliot.
Collection of currants	First	6.00—Nels. Anderson.
STRAWBERRIES—		
Gandy	First	2.00—Nels. Anderson.
Bubach	First	2.00—Nels. Anderson.
Manchester	First	2.00—Nels. Anderson.

VEGETABLES.

Collection of vegetables	First	$3.00—Joshua Allyn.
Beets	First	1.00—Joshua Allyn.
Carrots	First	1.00—Joshua Allyn.
Radishes	First	1.00—Joshua Allyn.
Turnips	First	1.00—Joshua Allyn.
Onions	First	1.00—Joshua Allyn.
Lettuce	First	1.00—Joshua Allyn.
Cabbages	First	1.00—Joshua Allyn.
Cauliflower	First	1.00—Joshua Allyn.
New potatoes	First	1.00—Joshua Allyn.
Beans	First	1.00—Joshua Allyn.
Asparagus	Second	.50—Joshua Allyn.
Asparagus	First	1.00—Wm. Lyons.

Signed,

W. E. PERKINS,
SARA M. MANNING,
HARRIETT B. SARGEANT.
Awarding Committee.

RECORD OF SUMMER MEETING.

(The talks in this record are not reported in full.)

Pursuant to notice, the summer meeting was held at Lake City, July 19, 1892. Arrangements had been made by the people of Lake City who had undertaken the entertainment of the society to hold an out-door meeting in the grove at the residence of J. M. Underwood; but, on account of the inclemency of the weather, it was found necessary to convene in-doors, and the session was held at Masonic Hall.

About forty members of the society were in attendance and as many more of the ladies and gentlemen of Lake City. The forenoon was passed in social converse, and in the examination of the exhibit of fruits, flowers and vegetables. At one o'clock the company gathered about the tables in the dining hall belonging to the Masonic rooms, where the hosts of the occasion had prepared an elegant dinner. After dinner, without adjourning from the dining room, the program prepared for the occasion was proceeded with, as follows:

President J. M. Underwood: I am not like Mark Tapley, jolly under all circumstances. We expected everything to be smiling and our meeting to be held in the grove, but the threat ening weather dampened my spirits until I came down town and met my friends here, who are always ready to support me in any emergency. They said it would be all right. I find myself much better natured and feeling much better now that the sun is shining again, than when everything was cloudy and ominous in the morning.

Our horticultural society has a membership of 325, the largest it has ever enjoyed, and we are fast making accessions to our numbers. In holding our summer meeting, as well as our winter meeting, we are always anxious to interest those who are not members, and the little slips at your plates will tell you how you can become members of our society.

I have the pleasure of introducing to you now the Hon. Wesley Kinney, who will give you a few words of welcome on the part of the people of Lake City.

Hon. Wesley Kinney: Ladies and gentlemen:—One of the happiest experiences of life, aside from the meeting of old friends, is the formation of new friendships and new ties, an opportunity for which this meeting affords.

As the president has stated that he was somewhat disappointed when the heavens were lowering before him, I was also disappointed when I thought, "Now, my little speech will not fit the occasion. I cannot say the earth is smiling." We cannot meet in the grove, and I cannot speak of the blooming flowers, the singing birds, etc., and I thought, "What can I say?" I thought I could refer to our magnificent system of waterworks, but you cannot see them through these walls of brick and mortar.

It needs no words of mine to convince you that the people of Lake City are glad to see you. And I speak in behalf of the mayor and the city council when I say the "freedom of the city" is granted you. You are welcome to all our households. We have many objects of interest here, not the least of which, in the views of some, may be Rest Island. I do not suppose any of you will visit it because of the remedies there applied, but you can visit it because of the beautiful scenery. You can step into the borders of our sister state across the river, and you will there see the rock where the Indian maiden threw herself into the lake. I am told the foot-prints where she set her feet are still to be found. I do not know this to be so.

The people of Lake City welcome you; the mayor and common council welcome you and bid you a glad and free welcome to our homes and households. To-day our homes are yours. You have only to take possession.

Response to the address of welcome, by Prof. C. D. Smith, of the State Agricultural College:

Mr. Chairman, gentlemen and ladies: I am almost too full for utterance. I appreciate your most hearty welcome. When your quondam mayor stood in the doorway, I thought dinner was to be very late, and I felt as the Methodist minister did when he was visiting at a farm house, and as he was waiting, thinking dinner would be brought on, he asked a little boy, "Johnny, when will your dinner be ready?" The little fellow answered, "As soon as you are gone."

Perhaps you called on me because you thought you would hear nothing about horticulture; perhaps it was you thought I would be brief. I am interested in an undertaking in which you all are interested, the agricultural school. While you are cultivating the berries and small fruits, and the whole line of horticultural products, we are trying to cultivate a still larger product whose fruitage is more important than all the horticultural fruits of the state combined.

You develop your own business; on the other hand, we must depend on you. We are glad to welcome the young boys to our school, as you are glad to welcome us here; and we hope to welcome the girls also, as soon as provision can be made for them. Send to me the name of every bright boy who is interested in farming. We desire to do them good.

We desire heartily to accept the welcome so cordially extended.

Music: Quartette.

TOAST: "Horticulture in Minnesota." Response by O. C. Gregg of Minneapolis, president of the Farmers' Institute:

Ladies and gentlemen:—Not because it is customary, but because I feel it, I wish to say that I have a very pleasing sensation come over me as I meet you here in Lake City to-day. I want to make a personal statement of fact. The time was when I regarded a horticulturist in Minnesota, as a misguided man, but I always had a respect for you as a body. I thought Minnesota was a land of blizzards and not of fruit, but I have been converted.

I was brought up a Methodist, and I look upon you as brethren and sisters in the great horticultural church. I have come to this belief by reason of experience. I was slow to believe, being, probably, naturally conservative, but I have seen so much of the successful work of the horticulturists of Minnesota, that I am forced to believe that it has in it all the elements of success. Perhaps you will say that all I mean is that we can raise choke cherries, etc., but I am satisfied that we are going to make a grand success of that New England product, the apple. We propose to stand by apples on the southwestern frontier, where my farm is, not with the hope only, but with the expectation, that we will succeed. I expect to-day, from branches in southwestern Minnesota, fruit that I shall pluck with my own hand.

Very naturally I regard this from the standpoint of one who goes about a good deal over the state. When I go through the streets of Minneapolis and see the little newsboys, I wish they had the privileges I had when I was a boy and could go out into the orchards and pluck all the fruit I wanted, club the trees etc. But there are many boys on farms even who are hungry for fruit. Very soon, however, we shall have a lot of boys and girls growing up who shall no longer hunger for fruit.

I look upon you this afternoon, and I say you are every one of you ministers, and may the Father of all bless you in the noble work in which you are engaged. The work has a brighter look than ever before. Some one asked me, "Do you think every one is going to raise fruit?" I said no, but scatter all the seed you can and some of it may fall into receptive soil. You who are old members of this horticultural society can take this consolation; you can say, "I earnestly work for a cause, that has made the state better." You can say that success is with you.

TOAST—"Our Birds." Response by Mrs. G. F. Benson, Lake City:

To the lover of nature there is no more delightful recreation than the study of birds in their native haunts. In one of his charming essays, Burroughs says that "people who have not made friends with the birds do not know how much they miss." In this locality we are fortunate in having a great variety of birds to observe, as the great valley of the Mississippi seems to be the place of meeting for those which are peculiar to the eastern part of the continent, and those which belong more especially to the western part. Then, in addition to the large number which breed here, we have occasional visitors from the far north, and in spring and fall thousands of migratory birds, the most dainty, the most bewitching little creatures that can be found outside the tropics. Indeed, I sometimes wonder if the tropical birds can be, after all, more beautiful than many which we can see any day, either around our homes, or by taking a short drive into the country.

A Minnesota author has said, "We Americans go to the ends of the world in search of that which often times may be found at our very doors," and I have often thought when looking through my field glass at one of these highly colored warblers, that were it only a foreign bird many would admire and exclaim at its beauty who now pass it by without a thought. What can be more brilliant than our Scarlet Tanager or the intense orange of the Baltimore Oriole? What color more exquisite than the heart-shaped pendant on the breast of the Rosebreasted Grosbeak? Look at the Blue Jay in his fresh full plumage! Notice in the sunlight the bronze and purple and green iridescence of the large Blackbirds, the blue and red of the Bluebird, the yellow and black of the Goldfinch, and where will you find a picture with such blending of shades and tints? Add to all this combination of colors the charm of life, and it comes nearer the heart than the most skillful painting ever done by the hand of man.

That birds are the friends of man and his helpers in the arts of horticulture and agriculture, is a fact long since acknowledged. Those who are interested in birds simply because they love them, and not because of their usefulness, are greatly indebted to horticulturists for their investigations of the habits of birds, and for the laws that have been enacted for their preservation. Were it not for these laws many species of our song birds would become extinct. When man joins himself to the long list of enemies which the song bird has to contend against, its doom is sealed. A recent effort to find a work of authority on our birds, resulted in information being received from the state librarian that the only account of the birds of Minnesota is to be found in the reports of the state horticultural society.

Here in our own little city the birds have many friends. The laws are generally well observed, and as a consequence many of the so-called wildwoods birds build their nests and rear their young near our homes. This forms one of the chief attractions of our villages, and it is sincerely to be hoped that throughout the state people will awake to the appreciation of this fact, and not only see that the laws respecting the safety of the birds are enforced more strictly, but devise some means whereby the increasing hordes of English Sparrows may be checked before our song birds are

crowded out and driven away from the homes they have known for so many summers, and the places they have cheered with their delicious music shall know them no more.

TOAST: "Our Fruit Garden,—Better than beef or beans." Response by Mrs. A. A. Kennedy, of Hutchinson.

When I read the note from our worthy secretary informing me that I would be expected to respond to this toast, I thought of our committee on arrangements as Paul said to the Romans, that they had "a zeal but not according to knowledge," and I wondered much that they should choose a crooked stick when they had such magnificent timber at their command. I have made and served a great many dishes of toast, but this is the first of this kind, I think.

When our Heavenly Father planned and brought into existence this world of ours the department of horticulture received his most careful consideration. Outside of the gift of his Son, fruit was his greatest gift to man, and I thank God, for granting me this privilege of lending a hand to help roll their car of salvation—I was going to say, and I think I will not change it, for, is not everything that pertains to the elevation, refinement and true enjoyment of the human family salvation? I think so. When the Great God created this world he cast his eye over the work of his hands and pronounced it very good, and then the very first thing he did was to make a garden, and he did not plant it to beans, nor fill it with herds of cattle, but planted it to fruit, as much as to say that this was the only diet fit for man in his purity. Beef and beans were an after-thought, and came in after the curse was pronounced. This is conclusive evidence that fruit is in the ascendancy. But let us look at it from another standpoint. In order to make 1,200 pounds of beef, it would take four acres of land to produce hay and pasturage, and one-third of an acre of corn, allowing 30 bushels per acre; and at four cents per pound, live weight, it would only come to $48.00. So it would take at the least four and one-third acres of land to make $48.00 worth of beef, and this is saying nothing of the care the first summer or the milk it would consume.

The outside figures for a crop of beans is 30 bushels per acre, at $2.00 per bushels, would be $60.00 per acre, while fruit with the same amount of cultivation will produce 2,000 quarts of berries, (I raised that many quarts from three-quarters of an acre last year) which at 10 cents a quart would bring $200.00; and there are those that do better still. Now, who that wishes to amass a fortune would think for one brief moment of raising beef or beans? Thus far I have said nothing in regard to the enjoyment we get. If any one would ask me how much enjoyment I get from my garden, I should have to answer as the little girl did when her mamma asked her how much she loved her.

TOAST: "Our Beautiful Wild Flowers,–Fast disappearing before the onward march of civilization." Response by Miss Sara M. Manning of Lake City.

Once as fell the evening twlight,
And the glowing tints of sunset
Linger'd in the western heaven,
Suddenly was sound of music

As of many sweet bells chiming
With a minor wail of sadness,
Like the music heard in dream-land.

'Twas the ringing of the "blue-bells,"
Each its tiny clapper swinging,
Calling all the flowers to council.
Then they came in all their beauty,
From the prairie, hill and forest,
With one impulse met together.

Much I wondered at the meeting.
Did wild flowers hold conventions?
Were they troubled with ambition?
Over all the fair assembly
Silence brooded calm and peaceful
As it were a Quaker meeting.

Then at last "Jack in the Pulpit,"
Moved by strange power to address them,
Stood erect and very solemn
'Neath his canopy bright-colored,
And he said to them "all evil
Cometh from the love of money,
This the root from which it springeth.
For this cause our tribes are driven
From the meadows and the prairies,
From the hills and fertile valleys,
By the onward march of progress,
As it journeys ever westward.
Weeds we are unto the farmer,
As he field to field still addeth,
Leaving us not e'en the hedgerows.
He cares nothing for our beauty;
Only for his wheat and barley
And the fruits his hand has planted."

"We, the rainbow tinted flowers,
Can alone find rest and safety
In dense thickets by the brook side,
Where no vandal plough can reach us;
On the bluffs so wild and lonely,
'Mid the lichen'd rocks and mosses."

"So methinks this is our mission
Making bright the lonely places,
That when tired of wheat and barley
And the fruits his hand has planted,
Even of his 'Russian Apples'
Of which wisely he discourses,"

"Should the thoughtful farmer wander
To our unfrequented region,
He may love us for our beauty,
He may learn from us the secret
Making bright the lonely places—
Thus we render good for evil."

As he ceased again a silence
Over all the fair assembly
Brooded, and the darkness gather'd.
Then again the bells were pealing,
But no minor wail of sadness
Linger'd in their sweet-toned chiming,
And the sound of sylvan voices
Mingled in harmonious accents
With the ringing of the "blue-bells,"
Sounding far away and fainter
"Good for evil, good for evil."

TOAST: "Research,—By it we will introduce much that will be valuable to our state." Response by John S. Harris, La Crescent.

Ladies and gentlemen:—I am not in the habit of making any apologies, but I cannot do justice to the subject to-day on account of sickness.

When man was created he was created to knowledge, and God made a garden and placed him in it and commanded him to keep it and to enjoy the fruits thereof. But man lost his position and God turned him off. I think he was locked out, and he went out into the cold, wide world. While he was there in Eden he had tasted all manner of beautiful fruits, he had all manner of beautiful flowers; and their influence has pervaded him all through the ages. But he grew from bad to worse; and finally he was driven from Eden and from the face of the earth, except Noah and his family; but in them the institution of horticulture was preserved.

Getting further along, we find that the Babylonians had fair hanging gardens. But the people had made research in order to have those gardens, the record of which, though brief, has been handed down to us.

During the dark ages there seems to have been a falling off in horticulture. Coming down to about four hundred years since, we find the principles had been kept alive, and probably in no past age of the world has there been as great an advance as within the last one hundred years.

Research has been the great element of this recent advance. Research has brought us scores of new fruits. The first instance of research upon record is in the good Book. It is of those who were sent into the land of Canaan and who brought back the grapes. I have no doubt they had more influence than all other things the spies told.

There is an opening to us for research. We have tried what are called native American fruits and introduced them into the state, and have very generally made failures of apples. We have been more successful with small fruits, but we have not been as successful as we desire. A few years ago, two men, Prof. C. L. Budd and Charles Gibb, made a journey

through some of the bleakest regions of Russia, and they came back to us bringing an abundance of fruits which they thought would thrive in this locality. But most of these are lacking; some have one difficulty and some another. There is still an aching void. We must search again. We must send more men to that land and see if we cannot find something that will answer our purpose better. All over this country the hardy pioneers brought seeds from their eastern homes, and we have trees twenty-five and thirty years of age. Research may find out some of these and we may receive good from it.

Again there is another wide field for research. There are fruits which we know would be useless planted here—the orange, the citron, the peach, etc. But we have native fruits that can be improved, that are hardy, that are adapted to our soil and climate, and that will be more wholesome and invigorating than the tropical fruits. Let us search our hills and forests and find the choke-cherry, the raspberry, the blackberry and the strawberry. Let us bring them in and place them in the hands of our experimenters, and encourage them to grow larger and better fruit, and then perhaps we will have fruit equal to that of any other land upon which the sun shines.

TOAST—"The Columbian Exposition." Response by A. W. Latham, Excelsior.

Mr. President, ladies and gentlemen:—With the consent of our president I will read the few remarks which I have prepared, as the members of our society are aware that I am not a public speaker. I do not feel so bad about this since the ladies who have preceded me, who, it is agreed, belong to the sex who are the best talkers, have both taken the liberty to read their replies. In regard to what I had to say on this question, the situation is radically changed by developments since this was written, and I feel obliged to leave out a portion, which, I regret to say, was overflowing with wit and humor. You will never know the amount of your loss, but I assure you, it is a great one.

There is a general belief that this exposition had its origin in the efforts of one Columbus, who lived a long time ago, so long ago that I doubt if even our veterans of this society, Mr. Harris and Col. Stevens, have any personal recollection in regard to it. The facts, as far as they can be reached, would indicate that this remarkable man, Columbus, planned and arranged for this exposition some time along the last of the 15th century. He was certainly a man with a genius for the future. It is a great thing for him, so many hundred years ago, to have devised such an institution as we understand this exposition is to be.

A historian, whose name I have forgotten, but upon whom we can depend probably as much as upon some other historians, says, I believe, that Columbus made up his mind at an early age that he would build a fleet of ships and quietly, without saying anything at all about it to his wife, for fear it should get out, would sail to the west and discover America; and it would seem that he had even then determined that the exposition, to be named after him, should be held in Chicago, on Lake Michigan; but it was necessary first to discover the country where this city was to be built. It is said that he was successful in his maritime venture, and early in the morning on the 12th of October, 1492, when from the masthead was heard the cry, "A light ahead!" this great man came hastily on deck and cried out, "There is America!"

I will not tire you with a romantic history of this explorer, but that he was successful in his plans to discover America, where was to be founded a great empire, of which the interior metropolis was to be the city on the lake, where was to be held the exposition to be named in his honor and to perpetuate his memory, we are all witnesses, and we all hope to be there and to assist in honoring this man of tremendous foresight and courage and perseverance.

While we do not know it to be really so, yet we believe he even had it in his plans to have laid out in this part of the country the fair state of Minnesota, for the purpose mainly of allowing the friends here gathered, and their predecessors, to organize this horticultural society with the design, without doubt, that, with other similar organizations, we should be present on the occasion of this exposition to assist in honoring and glorifying his name. That our society may be able to do this fittingly is certainly our hearty purpose and wish, although the apparatus for its accomplishment cannot really be said, as yet, to be in motion. The machine is planned, and its parts adjusted, the engineers are posted, and everything seems to be ready except the necessary orders to move. We are patiently waiting for this, and as somebody says, "All things come round to him who will but wait."

Our society, in common with the rest of mankind, should learn a lesson from the foresight and perseverance of this great man, long since passed away, but whose lesson forever remains. The work we are doing, not bearing fruit as we could wish in the present, is the substratum work that is bound to yield results in the future, we hope not so many hundred years from now, but within the knowledge and period of our immediate successors.

"Let us then be up and doing,"
And "learn to labor and to wait."

MUSIC: Lake City Quartette.

TOAST: "Our Women Allies,—The best half of horticulture."

Reponse by J. T. Grimes, Minneapolis.

Ladies and gentlemen:—I am aware that the subject assigned me is a delicate one, involving as it does the question of woman's right to the best of every good thing.

"Our Women Allies--The best half of horticulture."

In fact, without the refining influence of woman the "best half of horticulture" would be an unknown quantity, amounting to but very little in the economy of life's enjoyment. What did man know about horticulture anyway until woman had the courage to reach out her hand and pluck the fruit from the tree of knowledge, and tell him that it was fair to look upon and likewise good to eat? And having taken the initial step in this great work, she has led him on ever since, not by force, but simply by attraction, in the path of the beautiful, along which flowers bloom and fruits grow and ripen, whose luscious sweetness tickle the palates of the very gods. I mean, of course, gods of our fraternity.

Where would we be to-day without "our women allies?" Who was it that took us by the hand when we were innocent and childlike and pointed out the unfolding beauties of nature in bud, leaf, flower and fruit?

Who first taught us to say "Our Father which art in Heaven?" Can we ever forget that sainted mother?

Who led us along by the babbling brook and gathered wild flowers and placed the dainty violets and buttercups in our little hands as we journeyed on our way to school? Can we ever forget that loving sister?

And when with laughing pride, who shared our pleasure in the moonlight walk beneath the trellised arbor, where none would dare to intrude? Who plucked the blushing rose, and having kissed it, placed it upon our manly bosom? Can we ever, ever forget that dear sweetheart of ours, in the sacred memory of by-gone days? Can we forget?

And, who in all these years has clung to us like a tender vine, trusting, ever trusting? Who has been our guiding star to lead us on to deeds of noble purpose? Who was it that planned our home with all its beautiful surroundings, and placed her smile upon it? And who but *her* could train those olive plants that cluster around our frugal board. Woman, the angel of our hopes, "our better half," thee we can ne'er forget.

TOAST—"All Around in Horticulture." By Miss Ida E. Tilson, West Salem, Wis.

A certain theological professor charged a young minister, under his instruction, never to venture even a mile away from home without a sermon in his pocket. By past experience I have found it wise to take an essay with me. When, only a few minutes ago, our president assigned me a toast, I was glad I had along an essay lately read at the Wisconsin meeting, a part of which will be better than my random talk might prove, and, judging from the bountiful and beautiful repast spread before us, you can appreciate something on the subject of eatables.

Let us begin with my favorite asparagus, April's best gift, esteemed a delicacy as far back as the early Greeks. Till a recent period, however, its cultivation and preparation seemed among "lost arts." Two popular modern cook books, which we own, make meager mention of this root; and I once lived in a town whose principal gardener had plowed up his asparagus because of no market for it. But its valuable diuretic properties, and its early appearance when we so hunger for something new, fresh and green, are causing increased attention and appreciation. Our roots are eight or ten inches below the top of the ground, and, therefore, send up crisp, tender, blanched shoots, quite different from those green, woody ones whose roots are near the surface. The French believe asparagus promotes longevity. Of three famous savants who enjoyed it heartily, two lived over ninety years; the other died in his eighties because, as his companions believed, he did not eat asparagus enough.

Radishes, lettuce and young onions are May's tribute. Although yellow or white onions look delicate, we think the "red Wethersfield" is actually more sweet and tender. Raw onions now rank among the best of liver medicines, and in ancient Egypt this vegetable was worshipped as a sort of divinity. From every point of view there is no wonder the Israelites, in barren, bilious Arabia, wept for the leeks, onions and garlic of Egypt. Those bulbs had drawn tears before and have since.

The radish is anti-scorbutic, blood-purifying and tonic, while lettuce furnishes a nervine having all the value of opium and none of its ill effects.

June enriches our list with cooling strawberries. Shakespere's Richard III., in the midst of state-craft and slaughter, turns aside one moment to say—

"My lord of Ely, when I was last in Holborn
I saw good strawberries in your garden there;
I do beseech you send for some of them."

Horace Walpole named his lovely country-seat "Strawberry Hill." This plant is found wild and apparently native in both hemispheres, and has since received such further development, there is hardly a climate or soil to which some variety is not adapted.

We always hope to show patriotic sentiments "Fourth of July," by eating new potatoes, our own native American tubers. Long may they wave —their tops—in the gentle breezes, of course. Let Persia claim her beans and cucumbers, but give me "Mayflower" potatoes, or give me something better. The bean, however, has built up New England, and we all remember Daniel and his companions, excused from the king's wine and meat, were permitted a diet of pulse and water, "and at the end of ten days their countenances appeared fairer and fatter in flesh than all the children which did eat the portion of the king's meat." "As cool as a cucumber" was supposed to be nonsense, till an enterprising scientist introduced his thermometer into one near its center of growth, and found that point phenomenally cool. This plant has been used to assuage fevers, and if consumers can wait, as we do, till cucumbers are fully grown, just before turning yellow, no danger of cholera will ensue. That renowned traveler, Madam Ida Pfeiffer, at one time, for three days, could get nothing else to eat.

Tomatoes are good alone or combined, raw, stewed, baked or in soups, and their calomel makes them especially valuable for bilious persons. To get the best results, plants must be set early, and box-like inclosures or old peach baskets got ready for covering them frosty nights. My weary pilgrimages up and down our long row as,

"The shades of night were falling fast."

and again,

"At break of day,"

do indeed remind us of Longfellow's youth when

"From his lips escaped a groan, Excelsior!"

As for melons, having been robbed many years in succession, we long ago gave up the unequal contest of raising them, till now I hardly know in what month they come or any of their qualities.

Autumn has a royal gift of apples, plums, grapes and nuts. It is said a confirmed apple-eater never gets bilious, and the grape cure for consumption is well known. Then, when our land is fast locked in ice and snow, what satisfaction to contemplate canned fruit and jellies, crisp cabbages, golden squashes and pumpkins, onions in their airy crates, and turnips buried in sand or sawdust to prevent wilting.

Whoever takes pains to set out and cultivate a garden, can, in addition to his wholesome exercise, eat a complete course of medicine. Is not that better than a complete course of drugs? Of fifty-two centenarians examined by Prof. Humphry of Cambridge, nearly all were "small meat-eaters." "What can I do for my little boy,"asked a mother,"sothat he wont want to eat between meals?" "Have the meals thicker together?", replied this young gourmand. Piecing between meals, candy, spices, irritants and stimulants will tempt less where food is simple and nourishing, and work be done not on one's nerve but by genuine strength.

An Arabian legend says Satan, claiming the whole world, demanded, one year, half their crops for rent. Given his choice, he selected, as we might suppose, the top half. That year they planted turnips and carrots. Satan in a rage reversed his choice, whereupon the wily Arabs planted

corn, beans, buckwheat and perhaps, small fruits. Profit, health and comfort still rise from the garden and help vanquish "the world, the flesh, and the devil."

TOAST—"The Horticulturist,—While observing the laws of nature, he observes the laws of the land." Response by Hon. R. H. Moore, Lake City.

Mr. President, ladies and gentlemen:—I have no notes, not even a bank note. * * * * The horticulturist is an observer of the laws of the land. Abraham Lincoln usually fitted in a nice little story, and I am reminded of the story of the physician who was asked how was the health of the community. He answered, "It is distressingly healthy." Though you are horticulturists, you never "raise Cain," and so far as the criminal lawyers are concerned, you never "butter any of his parsnips." Perhaps you occasionally find a black sheep in the class to which I belong, but I believe you will have to search a long way before you will find a black sheep among the horticulturists, yet you will occasionally find one who will steal a row off from his neighbor's raspberry patch.

In this age in which we have a conflict of rights, it is pleasant to think that we have a class in our community that will offset a good deal of the evil that we annually import from abroad.

TOAST: "The Horticulturist,—The man who in nature's garden works with God." Responded to by Rev. E. B. Chase, Lake City, Minn.

Mr. Chairman, friends of horticulture:—I appreciate the honor of being called upon to say a word before this wise and practical body who are to be judged by the divine standard—"by their fruits ye shall know them."

It is because the fruits of horticulture have grown to such perfection, and been such a blessing in ameliorating the general condition of man, that it is every way fitting for brethren who try to conserve the spiritual welfare of man to plat a wreath with which to crown the brow of horticulture.

Did you ever think the first of all recorded industries was that of the horticulturist?

The Creator, himself, we are told, was a gardener, and that part, I suppose, has prompted the form of this toast. For if Kepler's thought be true in the realm of science, "I think thy thoughts after thee, O, God," it is equally true you think God's thoughts and work God's works. For we read in a work that has many hints on horticulture, that is not, however, quoted as authority on horticulture, that God planted a garden eastward in Eden, and there he put the man whom he had formed *to dress it and to keep it.*

I salute you then as the especially commissioned of God, you whom he called to carry on the work of creation he began. Christ, himself, who showed a most intimate knowledge of horticulture in the parable of the vine and branches, who said, grub out all that bear not fruit, in the miracle of cursing the barren fig trees, who showed his soul was near to nature when he said, "consider the lilies of the field," expressly declared the "works that I do shall you do, and greater works than these shall ye do." Let us wrest these words from their original application and see how the horticulturist illustrates their truth in the line of his grand calling.

Take Indian corn and see how man has changed and improved it. "Originally a tropical plant, it has gradually been changed in its character so as to mature its crop in the short seasons of Minnesota, and from a tall grass-like plant producing but little seed, it has been dwarfed and made much more prolific." Even the peach, native to Persia, has been largely improved till it ripens in various climes. Within the memories of some here fruits were few, flowers confined to the hollyhock and a few others, but now, thanks to the labors of your fellow-toilers, man has taken the few plants, fruits and flowers God has made, and has multiplied them almost beyond enumeration.

I recall my boyhood tramps after the wild strawberry. God made a good berry, it is true. He made man also in his image, and when he said dress and keep the garden, he started man in a direction of development, saying, "beat my berry," and man has done it. God made a few varieties of apples; the first work on pomology records twenty-three varieties. The horticulturist took up the work of making apples and pushed it onward till now we have more than 2,000 varieties; and man's experiments going on now in the hybridization may yet, with the Russian apple or some other, give you an apple tree for Minnesota's prairies that will defy Minnesota's arctic frost, blush in blossoms with the kiss of spring, and reward your labor with luscious autumnal fruitage.

But I need not weary you with multiplied illustrations of the way the horticulturist is working with God, or draw upon our imagination for the future, for from what you have already accomplished in increasing and improving what the Creator made, and from the varied and wise investigation and experiments now in full operation, we feel assured still greater victories and honors are to characterize your profession in evolving plant, tree and fruit till "the bounteous Eden, lost of yore, with fruits and flowers we would restore."

One thought more. The horticulturist is the man who, in nature's garden, works with God, for your calling is one that tends to bring out and develop the divine in men. In your cultivation of plant, flower, berry, tree, you come in close fellowship with nature, and are ever striving to find the true, the beautiful and the good, and that very effort brings out the divine in you.

Right here I am reminded of the story of the Scotchman and the Englishman who were talking together of their respective countries; the Englishman said: "You eat oats in Scotland, do you? We feed them to our horses in England." The Scotchman, not willing to be beaten, replied: "Yes, and whoever saw such horses as you have in England, or such *men* as we have in Scotland?"

The occupation of horticulture is one pre-eminently fitted to produce men made in the image of God, for the horticulturist, says another, "thinks as God thinks, in living forms." We think with words, God thinks in living forms of beauty and usefulness.

You also think in living forms; you plan to develop a living beauty. Your thought is seen, as for example, when you took the wild crab on the plains of Asia, small and "so sour as to turn the edge from of a knife",— and have given us the wonderful orchards of our eastern and more genial climes.

Your thinking in forms of beauty, starting with the simple rose of Eden, has developed the unsurpassed and varied splendor of the roses seen here before us this afternoon. So with nearly all our vegetables that we prize for their agreeable flavor and nutritive properties; together with our flowers they have been brought from a wild, unpalatable state by careful selection and cultivation to their present high state of development.

All these marvelous developments in forms of beauty and of fruitfulness, that have beautified, enriched and blessed the world, all imply culture, patience, skill on the part of the horticulturist like that of God's.

It is *thought* in the horticulturist's brain that has added to the primitive glories of creation. It is thought in his brain and arm which gives us a summer the year round. It is thought in the horticulturist that has enlarged the work God began.

"The man whose life work survives in the rose or strawberry is a creator, a benefactor, a teacher,"—a teacher and benefactor, first, in multiplying and improving the blessings God gave at first,—and second, by the efforts to produce these he has been saving man and restoring to a higher better type of manhood. While it has given new plants, flowers, and fruits, your calling, like the Scotchman's oats, has also been helping to make *men*.

The agencies of heaven all conserve the grander, higher nature of men, and you are co-laborers with the Infinite, for as He sets a high ideal so you bring into your daily task the ideal of the highest attainable perfection of growth and production.

You are satisfied with nothing that you, or that others have done. It is your duty, your design, your delight to enrich the earth with a wealth and beauty never before attained, and that noble discontent, that divine restlessness seen in man and peculiarly distinctive in the life of the horticulturist, has lifted humanity upon higher and holier planes of living, so that while you have been laboring to produce that which is more and more perfect, productive and beautiful in the world of nature, you have by your very effort been working in union with God in the production of a nobler type of man.

It was more than a coincidence then, it was prophecy indicative of the purifying and ennobling influence of your manhood-making calling, that Mary at the tomb of her risen Lord, whom she did not recognize, could think of no one more likely to possess the attractive features and intense look of love of the perfect man than that horticulturist who kept the garden where he had been buried. I will step aside to let Whittier place this wreath upon your brow,

"Oh, painter of the fruits and flowers,
We thank thee for the wise design,
Whereby these human hands of ours
In Nature's garden work with thine.

And thank that from our daily needs
The joy of simple faith is born;
That he who smites the summer weed,
Must trust Thee for the autumn corn.

Give fools their gold, and knaves their power,
Let fortune's bubble rise and fall,
Who sows a field or trains a flower,
Or plants a tree is more than all.

For he who blesses most is blest;
And God and man shall own his worth
Who toils to leave as his bequest
An added beauty to the earth.

And soon or late to all who sow
The time of harvest shall be given;
The flower shall bloom, the fruit shall grow,
If not on earth, at least in heaven."

Mr. J. S. Gray: Mr. President:—I wish to offer the following motion:

I move that the thanks of this society be and are hereby tendered to the people of Lake City for the bounteous feast we have enjoyed this day, provided by them for the members of this society, and also to the mayor and city council of Lake City for the "freedom of the city."

The motion was put by the president and carried unanimously. The report of Prof. S. B. Green, superintendent of central experiment station, was here submitted as follows: (See index.)

Music—Duet.

President Underwood: I thought, when Mr. Wyman Elliot announced that he could no longer be with us, but must take up his home somewhere else, what a great loss it would be to us, and, especially so, when I found myself in his position. But I have pleasure recently in the thought that Mr. Elliot is not going to leave us, but will be here to help in planning and carrying out the work of our society. We will hear from him in response to the toast, "Our Future,—What we have planned and what we will execute."

Response by Wyman Elliot, Minneapolis:

Mr. President, ladies and gentlemen: I think my mantle has fallen on pretty good shoulders. I think here to-day we have an evidence of it. What the future will bring forth we have yet to prove.

When I was a small boy I found it very hard to make a speech and to get up and say it, and now that I am grown it is no easier, so I have prepared a memorandum of what I want to say, and I leave it for you to judge whether it is applicable.

The amount of thought and right judgment exercised in our planning followed by persistent execution will largely determine what will be the future product of each individual, society or organization. Each detail of work from the first conception to the final completion must be pushed with vigor and zeal, in conformity with the laws of production, of whatever kind or nature the business consists. Let us plan ever so well or spec-

ulate ever so wisely, if there is a failure in the execution, our planning will prove of little value. The essential laws of production vary but little from season to season, the same general law governs *this* year that will govern next, or a hundred years hence, susceptible of variation only as we change the conditions from natural sources by artificial means. As I substitute or change the natural conditions with right judgment, so will my product be a success or failure.

Human nature is the same the world over. Some were born to plan and execute with thoughtful care and intelligent judgment, others can plan and only make failures in their execution, while others are only fitted to execute after another's planning.

I presume it is not expected that I am to express what the future acts of the members of this horticultural society will be, or the horticultural achievements that they may accomplish. I am no futurist, but prefer to be counted as an expectant of the present age, ever ready to deal with the problems in horticulture of to-day and leave what is to be hereafter to those who may seek to follow in our footsteps.

What we need most is to plan *well* for the present, see that our lamps are trimmed, and filled with the oil of persevering energy and industry, that their light may make bright the path we soon shall leave and enable those who follow to profit by our mistakes and successes.

At the conclusion of the program as rendered, the society adjourned to take a drive which had been arranged by the citizens of Lake City. The route of the drive lay through the grounds of the Jewell Nursery Company, the residence portion of Lake City and along the shores of Lake Pepin to Rest Island, where the company broke up. The various members of the society were taken to the homes of the citizens where they were entertained for the night.

Thus ended one of the most enjoyable summer sessions of the Minnesota State Horticultural Society, for the successful conduct of which the society is under great obligation to the people of Lake City.

Record of the Twenty-Sixth Annual Meeting

OF THE

Minnesota State Horticultural Society,

HELD AT MINNEAPOLIS, MINNESOTA, TUESDAY, WEDNESDAY, THURSDAY AND FRIDAY, JANUARY 10TH, 11TH, 12TH AND 13TH, 1893.

NOTICE.

Program of the twenty-sixth annual meeting of the Minnesota State Horticultural Society to be held in the Lumber Exchange, corner Fifth St. and Hennepin Ave., Minneapolis, Minn., Tuesday, Wednesday, Thursday and Friday, Jan. 10, 11, 12 and 13, 1893.

Keep this program for use at the meeting.

Annual membership fee, $1.00. Life membership, $10.00. Remit to the secretary.

The ladies are especially invited.

ANNOUNCEMENT.

The rapid growth of this society the past year, and the increasing interest in horticulture in our state, warrant the expectation that this meeting will be one of unusual interest, and all persons interested in any branch of horticulture, either as amateurs or professionals, are urgently invited to attend and take part in the proceedings.

Assurance is received of the presence with us of several prominent horticulturists from abroad, including B. E. Fernow, Chief of Forestry, H. E. Van Deman, Pomologist, Prof. N. E. Hansen, of Ames, Ia., and others.

The program has been prepared with special reference to allowing ample time for the discussion of every subject presented, of which a full stenographic report will be made for use in the published transactions of the society.

A liberal premium list has been prepared, to which your special attention is called. The interest of a meeting is much increased by a good exhibit, in making which you are urged to assist.

Especial interest attaches to this meeting from the fact that the horticultural exhibit from this state to be made at the Columbian Exposition the coming season is to be considered, and final arrangements made to secure the full co-operation of the members and the use of all the available horticultural resources of the state. Minnesota should stand second to no state in the beauty and quality of its horticultural display, and it is our privilege to see that it does not.

The usual reduction to one and one-third railroad fare has been secured, which will be available, however, only in case one hundred persons attend who hold receipts or certificates showing that they have paid full fare to the place of meeting. *Do not forget*, then, in purchasing ticket to call for a certificate from the agent showing that you have bought a full fare ticket to the meeting of this society.

Members, delegates and visitors reaching the city previous to the opening of the meeting are invited to call at the library, Room 2, No. 427 Nicollet avenue, which is the headquarters of the committee on reception, Col. J. H. Stevens, Wyman Elliot and Prof. S. B. Green. The address of the chairman of the committee on entertainment is C. L. Smith, editor Farmers Tribune, Minneapolis.

Papers publishing this program, or calling attention to this meeting and sending the secretary a marked copy of the paper containing the notice will receive, when published, a bound copy of the proceedings.

J. M. UNDERWOOD, President,
Lake City.

A. W. LATHAM, Secretary, Excelsior.

PROGRAM.

Tuesday Morning Session, 10 o'clock. General Subject, Small Fruits. Prayer. Opening remarks by the president. Appointment of committee on credentials.

Report of committee on small fruits—M. Pearce, Chowen; L. H. Wilcox, Hastings; J. A. Sampson, Excelsior; Mrs. A. A. Kennedy, Hutchinson; M. Cutler, Sumter.

Small Fruits—J. A. Sampson, Excelsior.

Improvements in Growing Strawberries—L. H. Wilcox, Hastings.

Tuesday Afternoon Session, 2 o'clock. General Subject, Small Fruits and Grapes.

Small Fruit Culture for the Farmers—C. L. Smith, Ed. Farmers Tribune, Minneapolis.

Horticulture for the Children—M. A. Thayer, President Wis. State Hort. Society, Sparta, Wis.

Fruit in the Red River Valley—E. W. Hazeltine, Grand Forks, N. D.

Horticulture in the Farmers' Institute—O. C. Gregg, Superintendent Farmers' Institute, Minneapolis.

3 o'clock. Report of committee on grapes—Daniel Buck, Mankato; A. H. Brackett, Minneapolis; E. J. Cutts, Howard,

A Woman's Experience in Vine Culture—Mrs. Sophronia Irwin, Excelsior.

Vine Growing in Wright County—E. J. Cutts, Howard Lake.

Tuesday Evening Session, 7:30 o'clock. Music.

Address of welcome—W. H. Eustis, Mayor of Minneapolis.

Response to address of welcome—Alfred Terry, Slayton.

President's annual address—J. M. Underwood, Lake City.

Music—

Annual report of secretary—A. W. Latham, Excelsior.

Annual report of treasurer—Ditus Day, Farmington.

Annual report of librarian—A. W. Latham, Excelsior.

What we know of the Effects of Electricity on Plant Growth—Prof. S. B. Green, St. Anthony Park.

Report of committee on legislation—J. H. Stevens, Minneapolis; Wyman Elliot, Minneapolis; F. G. Gould, Excelsior.

Appointment of committees on fruit list, award of premiums, suggestions for the good of the society, summer meeting, president's address, obituaries and final resolutions.

Wednesday Morning Session, 9 o'clock. General Subject, Apples and General Fruits.

Prayer.

It is expected that H. E. Van Deman. Pomologist of the U. S. Agricultural Department, will address the meeting during this session.

Report of committee on apples—Clarence Wedge, Albert Lea; R. C. Keel, Rochester; H. M. Lyman, Excelsior,

Hardy Apples in the Northwest—R. C. Keel, Rochester.

Crossing and Hybridizing of Fruits, Roses, etc—Prof. N. E. Hansen, Iowa Agricultural College, Ames, Iowa.

Report of committee on seedlings and fruits—J. S. Harris, La Crescent.

Report of committee on general fruits—M. W. Cook, Rochester; Alfred Terry, Slayton; G. W. Fuller, Litchfield; W. Mackintosh. Langdon; M. Pearce, Chowen; D. E. Myers, St. Cloud; D. T. Wheaton, Morris; Sidney Corp, Hammond; S. D. Richardson, Winnebago City; S. H. Kenney, Morristown; J. F. Zatterstrom, Spencer Brook; B. C. Yancey, Edina Mills; Mrs. P. A. Thayer, Sauk Rapids; Rev. O. A. Th. Solem, Halstad.

Wednesday Afternoon Session, 2 o'clock. General Subject, General Fruits.

Report of committee on plums and cherries—C. W. H. Heideman, New Ulm; O. M. Lord, Minnesota City.

The Leaves of our Hardy Trees—O. F. Brand, Faribault.

Rambling Thoughts on Horticulture—Wyman Elliot, Minneapolis.

Report of committee on fruit blossoms—L. H. Wilcox, Hastings; S. B. Green, St. Anthony Park; C. W. H. Heideman, New Ulm.

Reports of superintendents of experiment stations—Prof. S. B. Green, Central Station, St. Anthony Park; E. H. S. Dartt, Owatonna; F. H. Fiedler, Fergus Falls; B. F. Jenness, Willmar; Dewain Cook, Windom; Clarence Wedge, Albert Lea; Chas. W. Sampson, (grapes) Excelsior; O. M. Lord, (plums and small fruits) Minnesota City; C. W. H. Heideman, (plums and small fruits) New Ulm; D. E. Myers, St. Cloud; H. M. Lyman, (apples) Excelsior; J. S. Harris, La Crescent; L. R. Moyer, Montevideo.

Reports of vice presidents—Clarence Wedge, First Cong'l Dist. Albert Lea; Dewain Cook, Second Cong'l Dist. Windom; L. E. Day, Third Cong'l Dist. Farmington; R. S. Mackintosh, Fourth Cong'l Dist. Langdon; J. H. Stevens, Fifth Cong'l Dist. Minneapolis; Mrs. Jennie Stager, Sixth Cong'l Dist. Sauk Rapids; J. O. Barrett, Seventh Cong'l Dist. Brown's Valley.

Reports of local societies.

Wednesday Evening Session, 7:30 o'clock. General Subject, Forestry.

The lumbermen of the Northwest are especially invited to attend this session and take part in the discussion of this subject.

Address of welcome—Col. J. H. Stevens, President Minnesota Forestry Association.

Report of committee on forestry — G. W. Fuller, Litchfield; H. J. Ludlow, Worthington; Mrs. J. H. Brown, Lac qui Parle.

Report of committee on evergreens—C. P. Nichols, Northfield; G. W. Somerville, Sleepy Eye; Clarence Wedge, Albert Lea.

Practical Tree Planting on the Prairies and Preservation of the Natural Forest Region—Prof. D. R. McGinnis, Secretary of the Chamber of Commerce, Grand Forks, N. D.

Timber and Water Conservation—H. C. Putnam, Eau Claire, Wis.

Present Situation of the Forestry Problem—B. E. Fernow, Chief of Forestry, Washington, D. C.

Geo. C. Jones, Watertown, S. D., State Forester, E. T. Ensign of Colorado, and J. O. Barrett, Secretary Minnesota Forestry Association and others prominent in this field will be present or contribute papers for the occasion.

Thursday Morning Session, 9 o'clock. General Subject, Bee-Keeping and Fruit List.

Prayer.

Address by J. P. West, Hastings, President Bee-Keepers' Association.

Report of committee on apiculture—Dr. J. R. Walker, Leech Lake; Mrs. J. W. Blackwell, Alexandria.

Suggestions to Beginners in Bee-Keeping—C. C. Aldrich, Morristown. Further papers will be presented by Prof. S. B. Green and others, interspersed with discussions.

11 o'clock. Report of committee on fruit list.

Thursday Afternoon Session, 2 o'clock. General Subject, Annual Election and World's Fair.

Report of committee on award of premiums.

Report of committee on president's address.

Report of delegate to South Dakota Horticultural Society—C. W. H. Heideman, New Ulm.

Report of delegate to Iowa Horticultural Society—Clarence Wedge, Albert Lea.

Report of delegates to Am. Horticultural Society—Wyman Elliot and A. W. Latham.

Annual report of the executive committee.

Annual election of officers.

Status and Plans for the Minnesota Horticultural Exhibit at the Columbian Exposition—A. W. Latham, Superintendent.

Report of World's Fair committee—J. M. Underwood, W. Elliot, Prof. S. B. Green.

Forestry at the World's Fair—J. O. Barrett, Secretary Minnesota Forestry Association.

How can the Florist Assist in the Horticultural Exhibit at the World's Fair?—A. S. Swanson, St. Paul.

Thursday Evening Session; 7:30 o'clock. General Subject, Floriculture.

Report of committee on deciduous trees and shrubs—L. R. Moyer, Montevideo; Ralph D. Cleveland, Minneapolis; Wm. Wachlin, Faribault.

Report of committee on out-door herbaceous plants—L. R. Moyer, Montevideo; W. J. Wickersheim, Idlewild; Miss Sara M. Manning, Lake City.

The Prairie Flora of Western Minnesota—L. R. Moyer, Montevideo.

Report of committee on horticultural structures and implements—J. S. Gray, Minneapolis; A. S. Swanson, St. Paul.

Report of committee on house and greenhouse plants—F. G. Gould, Excelsior; Gust. Malmquist, Minneapolis; R. S. Mackintosh, Langdon.

Orchids—W. A. Manda, Short Hills, N. J.

Cosmos—Gust. Malmquist, Minneapolis.

Bulbs for Winter Forcing—R. J. Wessling, Minneapolis.

Roses for Winter Blooming—Victor Nelson, Minneapolis.

Plants for Early Flowering—E. Nagel, Minneapolis.

Carnations—F. G. Gould, Excelsior.

Friday Morning Session, 9 o'clock. General Subject, Vegetables, Sugar, Syrup and Pantry Stores. Prayer.

Agricultural Chemistry—Prof. H. Snyder, St. Anthony Park.

Report of committee on vegetables—Mrs. A. Bonniwell, Hutchinson; Joshua Allyn, Red Wing; E. M. Chandler, Minneapolis.

Onion Culture—J. J. Baston, St. Louis Park.

Horticulture on New Prairie Farms—Prof. W. M. Hays, Agricultural College, Fargo, N. D.

My Failure in Growing Celery—J. Allyn, Red Wing.

Report of committee on sugar and syrup—J. F. Porter, Red Wing; E. A. Lane, Chowen; Wm. Danforth, Red Wing.

One Method of Making Maple Syrup—E. A. Lane, Chowen.

Report of committee on cooking and pantry stores—Mrs. A. B. Underwood, Lake City; Mrs. S. B. Green, St. Anthony Park.

Fruits and Nutrition—Mrs. Clara S. Hays, Fargo, N. D.

Report of committees on suggestions for the good of the society and on summer meeting.

Friday Afternoon Session, 2 o'clock. General Subject, Meteorology, Entomology and Ornithology.

Report of committee on meteorology—Prof. C. W. Hall, Minneapolis; F. M. Crosby, Hastings.

Report of committee on entomology—J. S. Harris, La Crescent; Dr. M. M. Frisselle, Excelsior.

Insects Injurious to Orchards, etc., in 1892—Prof. Otto Lugger, Entomologist, State Experiment Station.

Report of committee on ornithology—Otto L. Bullis, Winnebago City; Mrs. G. F. Benson, Lake City; Albert Lano, Madison.

The Food of Birds—Albert Lano, Madison.

Report of committees on obituaries and on final resolutions.

Unfinished business.

Friday Evening. *By invitation*, the members of the society, delegates and invited guests and their wives *will meet in social gathering* on Friday vening at the residence of a citizen of Minneapolis.

PREMIUM LIST.

All exhibits must be entered with the secretary by 2 p. m. of the first day to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the article exhibited. The fruits, flowers and vegetables exhibited must have been grown in Minnesota.

All exhibits must be in place by 2 p. m. of the first day of the meeting.

Each exhibit of fruit or vegetables must consist of five specimens, and be worthy of a premium.

No premiums will be awarded on unworthy exhibits.

	1st Prem.	2d Prem.
APPLES.		
Collection ....3d prem. $3.00	$8.00	$5.00
Each variety exhibited	1.00	.50
Seedling apple, never before exhibited	5.00	3.00
GRAPES.		
Collection	5.00	3.00
Each variety exhibited	1.00	.50
CRANBERRIES.		
Collection	3.00	2.00
PLANTS IN POTS.		
Collection of ornamental and flowering plants	5.00	3.00
Single rose in bloom	1.00	.50
Single geranium in bloom	1.00	.50
Single begonia in bloom	1.00	.50
Single carnation in bloom	1.00	.50
Single orchid in bloom	1.00	.50
Any single plant in bloom	1.00	.50
CUT FLOWERS.		
Floral design	5.00	3.00
Collection of roses	2.00	1.00
Collection of carnations	2.00	1.00
Table bouquet	2.00	1.00
Basket of flowers	2.00	1.00
VEGETABLES.		
Collection—not less than ten kinds	5.00	3.00
Early potatoes, single variety	1.00	.50
Late potatoes, single variety	1.00	.50
Onions, single variety	1.00	.50
Turnips, single variety	1.00	.50
Beets, single variety	1.00	.50
Parsnips, single variety	1.00	.50
Carrots, single variety	1.00	.50
Celery, single variety	1.00	.50
Hubbard squash, (one specimen)	1.00	.50
Cabbage, (one specimen) single variety	1.00	.50
Cauliflower, (one specimen) single variety	1.00	.50

PANTRY STORES. PRODUCT OF 1892.

Collection of canned fruits	2.00	1.00
Collection of jellies	2.00	1.00
Collection of pickles	2.00	1.00
Maple syrup	2.00	1.00
Maple sugar	2.00	1.00

HONEY.

Collection of comb honey	5.00	3.00
Collection of extracted honey	3.00	2.00

AWARD OF PREMIUMS AT THE WINTER MEETING OF 1893.

APPLES.

	Premium.	Amt.
Collection	Second	$5.00—William Somerville.
Rollins Russett	First	1.00—William Somerville.
Rollins Pippin	First	1.00—William Somerville.
Rollins Prolific	First	1.00—William Somerville.
Wabasha	First	1.00—William Somerville.
Elgin Beauty	Second	.50—William Somerville.
Red Black	First	1.00—William Somerville.
Repka	First	1.00—William Somerville
Repka Malinka	Second	.50—William Somerville.
Autumn Streaked	Second	.50—William Somerville.
Red Queen	Second	.50—William Somerville.
Seedling	Second	3.00—P. D. Anderson.
Wealthy	Second	.50—Mrs. D. A. Gordon.
Russian crab	First	1.00—William Somerville.
Collection, 15 varieties	First	8.00—R. C. Keel.
Longfield,	Second	.50—R. C. Keel.
Utters Red	First	1.00—R. C. Keel.
Rollins Russett	Second	.50—R. C. Keel.
Rollins Pippin	Second	.50—R. C. Keel.
Rollins Prolific	Second	.50—R. C. Keel.
Autumn Streaked	First	1.00—R. C. Keel.
Red Streak	First	1.00—R. C. Keel.
Frost	First	1.00—R. C. Keel.
Red Queen	First	1.00—R. C. Keel.
Antonovka	First	1.00—R. C. Keel.
Good Peasant	First	1.00—R. C. Keel.
Clara	First	1.00—Ditus Day.
Famuese	First	1.00—Ditus Day.
Drake	First	1.00—Ditus Day.
Meaders Winter	First	1.00—Ditus Day.
Elgin Beauty	First	1.00—Clarence Wedge.
Wealthy	First	1.00—Clarence Wedge.
Hibernal	First	1.00—Clarence Wedge.
Repka Malinka	First	1.00—Clarence Wedge.
4 M. Ostrakoff	First	1.00—Clarence Wedge.
Longfield	First	1.00—Clarence Wedge.
Anis	First	1.00—Clarence Wedge.
Seedling, Lyle	First	5.00—E. D. Ames.

GRAPES.

Concord	Second	.50—H. L. Crane.
Lindley	Second	.50—H. L. Crane.
Brighton	Second	.50—H. L. Crane.
Duchess	Second	.50—H. L. Crane.
Iona	First	1.00—H. L. Crane.
Delaware	Second	.50—H. L. Crane.
Pocklington	First	1.00—H. L. Crane.
Collection	First	5.00—H. L. Crane.
Concord	First	1.00—A. W. Latham.
Delaware	First	1.00—A. W. Latham.
Duchess	First	1.00—A. W. Latham.
Agawam	Second	.50—A. W. Latham.
Brighton	First	1.00—A. W. Latham.
Lindley	First	1.00—A. W. Latham.
Collection	Second	3.00—A. W. Latham.
Agawam	First	1.00—M. M. Frisselle.
Massasoit	First	1.00—M. M. Frisselle.

PLANTS IN POTS.

Collection	First	5.00—E. Nagel & Co.
Geranium	First	1.00—E. Nagel & Co.
Begonia	First	1.00—E. Nagel & Co.
Carnation	First	1.00—E. Nagel & Co.
Single plant	First	1.00—E. Nagel & Co.

CUT FLOWERS.

Floral Design	First	$5.00—E. Nagel & Co.
Carnations	First	2.00—E. Nagel & Co.
Table bouquet	First	2.00—E. Nagel & Co.
Basket of flowers	First	2.00—E. Nagel & Co.

VEGETABLES.

Cabbage	First	$1.00—E. M. Chandler.
Collection	Second	3.00—H. F. Busse.
Early potatoes	Second	.50—H. F. Busse.
Turnips	First	1.00—H. F. Busse.
Carrots	Second	.50—H. F. Busse.
Collection, 25 varieties	First	5.00—Joshua Allyn.
Onions	First	1.00—Joshua Allyn.
Beets	First	1.00—Joshua Allyn.
Parsnips	Second	.50—Joshua Allyn.
Celery	First	1.00—Joshua Allyn.
Cabbage	Second	.50—Joshua Allyn.
Early potatoes	First	1.00—Joshua Allyn.
Late potatoes	Second	.50—Joshua Allyn.
Hubbard squash	First	1.00—Joshua Allyn.
Onions	Second	.50—E. M. Chandler.
Parsnips	First	1.00—E. M. Chandler.
Beets	Second	.50—J. A. Sampson.
Carrots	First	1.00—J. A. Sampson.
Hubbard squash	First	.50—J. A. Sampson.
Late potatoes,	First	1.00—J. G. Bass.

PANTRY STORES.

Collection of jellies	Second	1.00—Wm. Lyons.
Collection of canned fruits	First	2.00—Wm. Lyons.
Collection of pickles	First	2.00—Wm. Lyons.
Collection of jellies	First	2.00—Mrs. J. W. Blackwell.
Collection of canned fruits	Second	1.00—Mrs. J. W. Blackwell.
Sorghum syrup	First	2.00—Mrs. A. A. Kennedy.

HONEY.

Extracted	Second	2.00—J. W. Murray.
Extracted	First	3.00—Wm. Urie.
Comb	Second	3.00—Wm. Urie.
Comb	First	5.00—J. G. Bass.

RECORD OF

ANNUAL WINTER MEETING.

FIRST DAY.

MORNING SESSION, TUESDAY, JANUARY 10th, 1893.

About sixty members of the society were present when the meeting was called to order at 10 o'clock by the president, J. M. Underwood, of Lake City.

After prayer offered by the Rev. C. E. Page, of Windom, President Underwood opened the meeting with the following remarks: "Ladies and gentlemen and fellow members of the horticultural society:—It is needless, I hope, for me to express the pleasure that I feel at seeing you all here to-day. It is my belief that we are about to have one of the most successful meetings in the history of our society. I am confirmed in this opinion by the fact that I have been suddenly taken with a severe hoarseness which will deprive me, in a great measure, from saying very much, consequently you will have an opportunity to do your share of the talking [laughter]. I assure you that I regret I am not in a position to perform my ordinary functions of doing a good deal of talking, but it is undoubtedly a providence, and I suppose is intended to give you all a chance to say something [laughter]."

"The first thing in the order of business is the appointment of a committee on credentials, and I will name as members of that committee Dr. M. M. Frisselle, Mr. Joshua Allyn and Mr. Dewain Cook. The first thing on our program is the report of the several committees on small fruits. Mr. Pearce, of Chowen, is the first one named on the program, but as he is not here to report, I will call upon Mr. L. H. Wilcox."

Mr. L. H. Wilcox, of Hastings, submitted a verbal report, which will be found in its proper place under the head of "Small Fruits." (See index.) His report was followed by that of Mr. J. A. Sampson, of Excelsior. (See index.) Mrs. A. A. Kennedy, of Hutchinson, then submitted her report as a member of the same committee. (See index.)

These papers were followed by an interesting discussion. Mr. J. A. Sampson, of Excelsior, then read a paper on "Small Fruits." (See index.) This was followed by a paper on "Improvements in Growing Strawberries," by L. H. Wilcox, of Hastings. (See index.)

Mr. Wyman Elliot here asked the attention of the society a moment in order to suggest that an invitation be sent to the governor and both houses of the legislature to attend the meetings of the society.

It was moved by Mr. C. L. Smith that Mr. Elliot's suggestion be acted upon, and was amended by Mr. J. O. Barrett that the forestry association be included. Motion carried unanimously.

The chair appointed the following committee—Mr. L. H. Wilcox, Mr. Wyman Elliot and Col. J. H. Stevens—to forward the invitation. At the request of Mr. Wyman Elliot, Mr. C. L. Smith was substituted in his place.

An adjournment was then taken until 2 o'clock.

AFTERNOON SESSION, 2. P. M. TUESDAY, JANUARY 10.

After the meeting was called to order by Pres. J. M. Underwood, Mr. C. L. Smith, the editor of the Farmers' Tribune, Minneapolis, submitted his paper, "Small Fruit Culture for the Farmers." (See index.) Mr. Smith remarked that his paper might seem a little stale after the interesting ones read before dinner, but that in writing it he had borne in mind the many who would not be able to attend the meeting, and hoped it would be of some value to them when it appeared in the report.

It was followed by considerable discussion, after which Pres. Underwood introduced Mr. M. A. Thayer, president of the Wisconsin State Horticultural Society, remarking that Mr. Thayer did not need an introduction, "though", said he, "some of you may not know that he is a gentlemen who says he runs a bank for his money and raises fruit for his fun. I think, perhaps, he gets more money out of his fruit than out of his bank." (Laughter.)

Mr. Thayer remarked as he stepped forward and received the applause of the meeting, that he didn't know about that introduction. "Of course", said he "when I commenced raising berries I was in the banking busines, but now the berry business is the business, and running the bank is the fun." (Laughter.) Mr. Thayer then read the following very interesting paper:

HORTICULTURE FOR THE CHILDREN.

M. A. THAYER, Sparta, Wis.

The heart of a child has been likened unto a sheet of white paper, each day's action writing a word, each year a line, and the paper when complete being a life history.

As a horticulturist I would liken the heart of a child unto a rich unplanted garden, with warm, well prepared soil ready alike for the artistic gardener with his fruit and flowers, forms of health and beauty, or the careless husbandman with his weed and thistle. Well may we pause and inquire, "What shall the harvest be?" and well should we direct this important work.

The love of fruits and flowers is universal and no influence is more refining or impression more lasting. They impart inspiration to all. The mystery of the feeding root, the structure of the breathing leaf, the delicate tint of the bursting bud, the perfume of the fragrant blossom, the forming of the healthful fruit and its luscious maturity, are subjects for deepest thought and reflection.

The memory of a home in childhood, where fruits and flowers abound will remain bright until the steps are infirm and the hair is white with age. If you would have your memory cherished by your children, or your grave strewn with flowers when you are gone, then give them these companions in childhood.

Statistics show that the growing of fruits and flowers is very much neglected, especially by our farmers, not one in twenty giving any attention to them. To stimulate and quicken the love of horticulture among all our people it would, if possible, seem advisable to devise some means by which public distribution may be made to all the children in the state.

My attention was first strongly directed to this matter by a little gift thoughtlessly made to the school children of my own city of Sparta, two years ago, when over four hundred came to my farm, one and one-half miles distant, for a single red and black raspberry. The interest of these children all through the season was a perfect surprise.

To stimulate and encourage the work further, and test the feelings of the children generally, I made a proposition to our state horticultural society to donate 6,000 strawberry plants to the first 1,000 children who would receive and care for them under such rules and regulations as the society might see fit to make.

The committee appointed for this purpose after considerable thought formulated a plan which was embodied in a circular, as follows:

WISCONSIN STATE HORTICULTURAL SOCIETY.
SECRETARY'S OFFICE, Evansville, Wis., March 21, 1892.

To Superintendents, Officers and Teachers of our Public Schools:

The Wisconsin State Horticultural Society most heartily approves of the observance of Arbor Day in all of the district schools of our state. As a means of expressing its sympathy with the good work, the following circular is submitted as an accompaniment to the one issued by the Department of Public Instruction.

To aid in the selection of proper trees and shrubs for planting on school grounds, the society recommends the following list to select from and gives preference in the order named. From long experience we have found that nursery grown trees, or those which have once or twice been transplanted are preferable, and any nurseryman in our state will sell for

this purpose at wholesale prices. But if not convenient to get nursery trees go to the woods and dig thrifty growing deciduous trees of our common varieties. We do not recommend taking evergreens from the forest unless they are very small, and those are not desirable.

LIST OF TREES AND SHRUBS FOR PLANTING.

Evergreens.—Norway Spruce, White Spruce, White Pine, Balsam Fir, Austrian Pine, Scotch Pine, American Arbor Vitæ.

Specially adapted to smaller grounds.—Siberian Arbor Vitæ, Hemlock Spruce, Red Cedar, Dwarf Pine, Red or Norway Pine.

Deciduous Trees.—White Elm, Hard or Sugar Maple, Basswood or Linden, Black Walnut, White Ash, Green Ash, Cut-leaf or Weeping Birch, White or Canoe Birch, Wild Black Cherry, American Larch, Box Elder or Ash-leaf Maple, Wisconsin Weeping Willow.

Adapted to smaller grounds.—Hackberry, American and European Mountain Ash, Oak-leaf Mountain Ash, Black Elder.

Ornamental Hardy Shrubs.—White Purple and Persian Lilacs, Snowball, Tartarian Honeysuckle, Syringa, Ninebark, Purple leaf Berberry, Weigelia Rosea, Scarlet Dogwood, European Strawberry Tree.

Hardy Climbers.—American Ivy or Virginia Creeper, Scarlet Honeysuckle, Fragrant Honeysuckle, Virgin's Bower, Bittersweet.

OF INTEREST TO PUPILS.

The teacher is requested to call the attention of the pupils to the following proposed plant distribution of the Wisconsin State Horticultural Society:

With the aim of promoting the observance of Arbor Day in the district schools of Wisconsin, of encouraging in the young a love for horticulture and of stimulating the culture of small fruits in private gardens, the Wisconsin State Horticultural Society proposes to donate six strawberry plants of an approved variety to each of certain pupils residing in any school district of Wisconsin in which Arbor Day shall be observed in the year 1892, in accordance with the plan recommended in the accompanying Arbor Day circular—the proposed distribution of plants to be subject to the following conditions:

CONDITION OF THE PLANT DISTRIBUTION.

(1). The distribution of plants will be made only in such district schools as shall observe Arbor Day, after the plan proposed in the accompanying Arbor Day circular, or after a similar plan; and in such schools only upon condition that the teacher shall volunteer to act as the agent of this society in determining the eligibility of applicants for plants, in collecting and forwarding transportation fees, with a list of the names of the applicants entitled to receive plants, and in attending to the distribution of the plants when the same shall be received. The teacher may depute this work to some responsible pupil or other person, provided he or she shall exercise care that it is properly done.

(2). A transportation fee of five cents will be required of each eligible applicant for plants, this fee to be paid to the teacher, or person appointed by him or her to make such collection, and the teacher will forward the amount thus received, in postage stamps (less two cents which may be retained for posting letter) to Carl H. Potter, Corresponding Secretary, Wisconsin State Horticultural Society, Madison, Wis., within five days succeeding Arbor Day.

(3). No pupil shall be entitled to receive plants who has not attained the age of twelve years, and who has not attended school within the district in which he or she resides for at least four consecutive weeks during the current school year.

(4). Not more than two pupils belonging to any one family shall be entitled to receive plants.

(5). No pupil shall be entitled to receive plants who does not agree to plant and care for the same in accordance with the directions accompanying the plants.

Every pupil who receives plants will be expected to write on a postal card, during the first week in October, 1892, the number of plants that have lived through the season, and the number of young plants that have grown from the same, and to direct and mail such postal card to the corresponding secretary of this society, as named above. Neglect to make this report will render any recipient of plants ineligible in future plant distributions of this society.

A YOUNG PEOPLE'S HORTICULTURAL SOCIETY.

In any school in which ten or more pupils, who are eligible to receive plants under the conditions named above, shall apply for the same, it is recommended that such pupils form themselves into a young people's horticultural society, to be governed by the following constitution, provided that the teacher of the school or some other person at least eighteen years of age, who understands the elements of parliamentary usage, will volunteer to act as presiding officer at the meetings of such society.

CONSTITUTION FOR YOUNG PEOPLE'S HORTICULTURAL SOCIETY.

(1). This organization shall be known as the (name to be chosen by members) Horticultural Society.

(2). Its officers shall consist of a president, who shall preside at all meetings; a secretary, who shall record the minutes of the meetings and conduct the correspondence of the society, and a treasurer, who shall hold the funds of the society subject to the written order of the president. These officers shall be elected by ballot at the spring meeting of the society, and shall continue in office until their successors are elected.

(3). Pupils eligible to receive plants under the conditions specified in this circular, who have applied for the same, and who have paid the required fee, shall be charter members of this society. Such charter members may elect other persons over twelve years of age to membership by a two-thirds vote. Such elected person shall pay to the secretary a membership fee of five cents.

(4). A majority of the members shall be necessary to constitute a quorum for the transaction of business.

(5). Not less than two meetings shall be held by this society during each year; one, to be called the spring meeting, shall be held on Arbor Day; the other, to be called the fall meeting, on the first Tuesday of October. At each of these meetings at least two papers shall be presented on some horticultural subject; the papers and subjects to be assigned by the president. Other meetings may be held at the call of the president.

At both the spring and fall meetings, the secretary of this society must send a report to the corresponding secretary of the Wisconsin Horticultural Society of the number of members, the number of meetings held since the last report, the numbers and titles of the papers presented; and at the fall meeting, a report must be sent of the condition of all plants furnished by the state society, as prescribed elsewhere in this circular.

The newspapers of the state are earnestly requested to co-operate with us by calling the attention of school district officers, and their readers, to the subject matter of this circular, to the end that Arbor Day may be properly observed throughout our state.

M. A. THAYER, *President*,
Sparta.

B. S. HOXIE, *Secretary*,
Evansville.

This circular was distributed to every school district throughout the state by our state superintendent of schools in connection with Arbor Day circulars, and the interest taken by both teachers and pupils has exceeded our most sanguine expectations.

The following report shows results of the Arbor Day observance and plant distribution:

Arbor Day was observed with appropriate ceremonies in nearly every city and village throughout the state, also in 2,408 school districts outside the cities and villages. 18,393 trees were thus planted in observance of this new and beautiful custom. 205 teachers, representing 1,393 pupils, applied for strawberry plants, to whom 8,358 plants were sent, with full instructions for preparing the ground, setting plants and protecting same.

October reports have been received from several hundred of these pupils, many of them giving in detail their success or failure, but all manifesting a great interest in the new work.

The following letters are a fair sample of hundreds received at that time:

PLAIN P. O., WIS., October 31, 1892.

"M. A. THAYER, Prest. Wis. State Horticultural Society. *Dear Sir:*—I received from your fruit farms six strawberries, for good attendance, on Arbor Day, to school district No. 3. I was very much pleased with the plants; they all lived but one, and then I took one of the runners and planted it in its place, and now it it as large as any of them, and they look very nice at present. I thank you very much for your kindness.

Very truly yours,
MISS LUCY L. WILCOX."

SPRING GREEN, WIS., Oct. 16, 1892.

"*Dear Sir:*—I began with four plants, and I done it according to directions, and I have planted out sixty-one runners from those four plants; altogether I have sixty-five plants; and if any one else has raised more than I have from four plants, I should like to hear from you.

Very truly,
CORA ROBSON."

GLASGOW, WIS., October 10, 1892.

"*Dear Sir:*—Four of the six plants you sent me lived. I kept the runners picked off until about the middle of July. I now have a row about fourteen feet long and eighteen inches wide. The plants are so thick that I cannot count them. Yours truly,
WILLIE TUCKER."

AVON, WIS., Oct. 8, 1892.

"MR. THAYER, *Dear Sir:*—The strawberry plants which I received from you last spring all lived except two, one of them died and the other was pulled up while one of my friends (who could not see very well) was pulling a weed. Between 400 and 500 runners have come from the four old plants. I tended them the best I could; I kept every weed out of them. I am very much pleased with the young plants, and I thank you ever so much for sending them to me, I remain as ever,

Your friend, LOLA M. DANE."

TWO RIVERS, Wis., Oct. 6, 1892.

"M. A. THAYER, Pres. Wis. H. S. *Dear Sir:*—My plants that I received all lived except one, and there are so many new shoots that I cannot count them. Hope they will continue so, as I am very pleased with them,

Yours truly, META KAHRS."

ARGYLE, WIS., Oct. 7, 1892.

"HON. M. A. THAYER, *Dear Sir:*—The 12 plants obtained through the conduction of Miss Susan Bentson have multiplied greatly, having propagated some 204 new plants. One male and a female died,

Respectfully yours, MARTIN AND EMMA JOHNSON.

The great interest manifested in these letters should stimulate all horticulturists to make liberal donations in this direction. It should also stimulate parents and teachers to encourage their children and pupils

in every possible way to take part in future distributions and form local horticultural societies, with regular meetings to study and practice this work, both in the home and on the school ground.

Almost the first want of a child is to possess something for its own—it is the ruling passion of man from the cradle to the grave.

The principle of ownership should be just as sacredly guarded in the most trivial posessions of a child as the largest business of an individual or corporation. *My first* experience in this direction made a lasting impression, and it is no doubt the same with many other farmer boys. An indulgent father gave me a pig all my own. I loved that pig as I never loved a pig before or since. I petted it; I fed it; I cared for it as my first great wealth. It was more to me than bonds, stock or lands. I felt as rich as a young Vanderbilt, but alas, my pig became a hog, and then, unhappy day! *my pig was father's hog*, and I had nothingto show for it.

I tell you, my friends, be careful how the boy's pig becomes father's hog; be careful how the boy's calf becomes the father's cow. A child should be taught lessons in ownership, possession and responsibility. Give them something all their own. If a colt, they should have it when a horse: if a lamb, give them the sheep: also, if a plat of ground, let them have the product.

There is no better way to start a child in this experience than with fruits and flowers. A dozen strawberry plants set in the spring may produce 500 in the fall, and the next season yield a bountiful supply of delicious fruit.

The work in all its detail is healthful, easy and pleasant. The growth is rapid and results profitable. What is true of strawberries is also true of many other plants and flowers.

To the state horticultural society of Minnesota I now make the same proposition I made my own state society last year: to donate 6,000 strawberry plants to the first 1,000 children in Minnesota, who will receive and care for them under such regulations as you may see fit to adopt. I shall donate 30,000 plants to my own society this season for distribution as before, and I hope to see sufficient interest in Minnesota to warrant a similar donation to this society another year. I want to see every child the real possessor and owner of a plant, flower or shrub, to care for, protect and propagate. Those who are successful with small plants should be encouraged with larger ones the following year, and so on, year after year, until every child becomes a practical horticulturist. I want to see this work done so thoroughly that every child may have the honor of surrounding his or her home with beautiful flowers and delicious fruits; and that every family will from actual experience acknowledge the refining influence of horticulture.

Discussion.

Mr. Thayer: In that letter which I mentioned in my paper, I sent out instructions to the children how to set out the plants, and I also sent some illustrations of the pistillate and non-pistillate varieties, and gave instructions also how to spread the roots, etc.

President Underwood: I know how interested you were in listening to this valuable paper of Mr. Thayer's and I hope you will discuss it thoroughly, asking Mr. Thayer all the questions you can possibly think of.

Mr. C. L. Smith: I move that the magnanimous offer of our friend Mr. Thayer, be accepted by the Minnesota State Horticultural Society with thanks.

Mr. Sampson: I second the motion.

Mr. Alfred Terry: In seconding the motion I would like to say that Mr. Thayer's work in Wisconsin reminds me of the work done by our ever to be remembered Mr. Hodge. I have seen the time in years gone by when the little ones from nine years old and upwards were planting some thousands of trees in order to get the medal, and I have seen in later years some of those trees planted by the then young men. I remember very well the work that Mr. Hodge performed in the southern part of the state, where as yet we had no artificial forests at all, but which is now dotted over with trees that were planted by those children, or afterwards replanted by their parents, who could only have been made tree planters through the leading of the little children. I feel that Wisconsin has a Hodge, and I hope that Mr. Barrett will take Brother Hodge's place in this state, and establish groves on our prairies, in whose shade those who follow us will sit and cry "Woodman, spare that tree" to this country. (Applause.)

Mr. Barrett: I want to say that this experimentation, and its consequent suggestions, offered to us in Minnesota, strikes me as the most practical enterprise that we can engage in As the secretary of the forestry association, I feel as though I had a new inspiration in this arduous battle for the right—for the planting of trees, and I think I could be instrumental in reaching the young people in some such way as Mr. Thayer has mapped out. It looks to me as though we could combine horticulture and forestry in a matter of this kind, and largely through the distribution of circulars, and similar methods. I would like to ask Mr. Thayer if the Arbor Day experiment in planting trees was a success.

Mr. Thayer: Report shows that over two thousand districts outside of the cities observed Arbor Day and planted 18,393 trees.

I wish to say, Mr. President, that there are very few in this room who appreciate how much can be done in the direction I suggested. You cannot realize the feelings of those children

until you have read their letters as I have done. I noticed it even in my own little town when I gave them a donation two years ago, and I had no idea when I made them the offer, that if they would come to my place the next day I would give them some raspberries, that there would be more than a dozen there; but the next morning at seven o'clock I found a dozen or two waiting for me, and all day long they kept me busy doing up little packages of red and black raspberries. All that summer children waited for me to tell me about those plants, and how they watered them every day, and still they died. (Laughter. Or else they hoed them every day, or the bugs eat the tops off —they told me every detail about them. It has made those children very friendly to me, so much so that I am well paid for my little donation by the look of gratefulness and interest on their faces when I meet them. The idea of sending out those plants with instructions showing how they should be cared for, and the business of writing for them, and all those things—I tell you it pays one a hundred times for all the trouble.

I would suggest, if you have a state school superintendent, if he will allow you to embody this circular in his Arbor Day circular, it will be of vast assistance to you, and there is one point you want to work for—to have the state do this distributing. Have this bound with the Arbor Day circular, and the state then distributes them to every district, and thus you will reach every school district. You will find that this plan of sending out these plants will furnish considerable work for your corresponding secretary, as the reports are generally made to him. I think if you will follow the plan out you will do more to advance the cause of horticulture in this state in the next ten years than you could do with ten times the same amount of work in any other direction. It will reach families that you can reach in no other way.

Few of you, unless you have taken the pains to ascertain the condition of the farmers, know to what extent they neglect the fruits and flowers. Why, our society three years ago sent out five or six hundred circulars to different parts of our state asking certain questions. Among those questions was this one: "What proportion of farmers in your vicinity raise fruit and flowers of the varieties ordinarily grown?" These letters came back with replies like this: "Not one in one hundred;" "Not one within five miles of here;" "Not one in fifty;" and I think there were only

very few that put them at less than not one in ten or twenty. The returns showed that not one in thirty or forty on the average raised fruit for their own family use. Now, it seems to me that this is the way to reach those families. If there is any horticultural taste in the father, mother or child, you can reach it this way. Of course this circular is subject to improvement, and I think you should appoint a committee if you accept the offer, to make such changes as you would think would be in the line of improvement. I know if you do this one year, that the letters coming from these children to this society will cause many of your members to rise up and pledge even fifty or one hundred thousand plants if you need them. You have whole-souled nurserymen and fruit growers in Minnesota, and they will all be glad to contribute to this movement after it is started.

Mr. C. L. Smith: As an indication of the interest that the children in Minnesota take in matters of that kind I will say that a year ago I sent a little slip to about three hundred country newspapers in Minnesota, stating that I would send to any girl or boy who would send me the names of twenty-five farmers receiving mail at their post office, a dozen strawberry plants free by mail. That advertisement appeared just once, and I immediately had to send a notice to the publishers that they need not continue the notice as I had more letters than I could answer in two months. Under that arrangement I had to send out 7,800 strawberry plants last spring to the boys and girls of Minnesota.

It was moved by Mr. J. A. Sampson, of Excelsior, that a committee of three be appointed to take charge of this matter, one member of that commitee to be the secretary of the society. Mr. J. O. Barrett of Brown's Valley suggested the appointment on that committee of a member of the forestry association. The motion, seconded by Mr. Alfred Terry of Slayton, was withdrawn after considerable discussion, as the matter was already in the hands of the executive committee, lying over from last year.

President Underwood: I take pleasure in introducing to the society, Mr. O. C. Gregg, who will address us upon "Horticulture in the Farmers' Institute:"

Mr. O. C. Gregg. *Mr. President, ladies and gentlemen:* I assure you it gives me much pleasure to appear before you to-day. I never look upon this assembly, but with a very vivid remembrance of its relation to the farmers' institutes of our state. When the work was first being started, we found some of your members our staunchest friends, and we received

from your ranks, and are now receiving, some of our very best institute intructors. I am here to-day at the request of your secretary, to talk to you a little while concerning the work of horticultural instruction as conducted in our institutes,and,undoubtedly, I could make a very long report if I gave you a detailed account of what we do; but I think this is hardly from the fact that many of you have already attended our institutes and necessary know what the work is. I have thought, however, it would be very proper for me to discuss some principles which I think should be kept in mind in conducting this work in our farmers' institutes. I am pretty well persuaded that there are some, at least, who fail to understand the true situation of the case. The work in this line in our state has very naturally taught me some things; yet I am fully persuaded I have a good many more to learn.

The first point I will make with you is this: in order to conduct this work successfully in our institutes, there is great need of tact. The speaker before me has very truthfully and attractively outlined the situation in Wisconsin, which is very like that which we find in Minnesota. The average farmer takes but very little interest in horticulture, and consequently has done little or nothing in the line of fruit growing. When you approach him in a public meeting on this matter, you must use a good deal of tact. I think we can best illustrate this matter of tact by telling a little story which some of you may have already heard and forgotten. This story is about a little incident that occurred in the life of that great family which is sometimes called the third department of the human family, namely, the Beecher family. I always had a great admiration for them. It is said that Henry Ward Beecher was at one time attending a ministerial meeting where they had been discussing at some length the great difficulties attendant upon the planting and the growth of this grand gospel, and they laid many things up to the charge of old Adam and to the Devil, in general. Henry Ward Beecher sat there in their midst undoubtedly thinking that there were many things charged by men to old Adam that should be answered for by themselves. So he rose and said, "Brethren, we are taught we are fishers of men, and my own experience has taught me that there are two kinds of fishers. One of them takes a very finely polished pole, with a very fine line, and attaches it to a neat hook nicely baited and approaches the stream with soft tread, throws his line and hook carefully and gracefully and skillfully over into the water, catches his fish and returns at night with his basket full. There is another kind of fisher who cuts down a big pole and ties on it a big coarse line and a big hook, and he dosen't even expect to bait it, but walks up to the stream with a sort of authority and threshes the water, saying, "Now bite, or be damned." (Laughter.) Now, I told that story to illustrate what I would call, on the one hand, tact, and, on other hand, the lack of it.

Now, then, the next point I want to make is this: In order to exercise tact you must have a pretty fair conception of the kind of fish you are going to catch, and as a rule men are exceedingly shy. They belong to the trout variety. I am well aware that there are some mullet heads among them, (laughter) but my experience in life has led me to entertain very much respect for the average man. It is not wise to discount him. Now, I want to bring before you a Minnesota farmers' institute, and, first, I want to tell you how they are brought together. A happy thought came to my friend,who acts as our assistant,in connection with a book that

we found necessary to distribute, and we started out to distribute those books in our institute work, advertising that a certain number of copies of a valuable book would be given free at each of the meetings. The book was a really desirable possession. We have tried to present it to be just what it is, and it was a surprise to us to see how far reaching that advertisement was. Time and time again we have opened up our institutes at half-past nine, though generally at ten o'clock in the morning—that is as early as we can get together on the first day—in the largest halls furnished by our state, and had every seat occupied by ten o'clock. I have known men to be there after having driven ten or fifteen miles in cold and wintry weather, so they might be sure that the book promised would not be lost by them through any failure of theirs to be on time. As the doctor said, "The average man wants to possess something for nothing, and in that way you have a big hold on him." We have to study those things and we do study them. I believe if I were put to-day into the ante room of a hall with my eyes bandaged, and then the bandage taken off, I could make a pretty shrewd guess, by the way people come into the hall, as to whether they come from mere curiosity or from an interest in the meeting itself. When they come from curiosity they fill up the back part of the hall first, and you always have plenty of room down where the Methodists put their mourner's bench. On the other hand, after the work has been established in a place, and the people become interested in the themes which are presented, then they begin to fill up the front seats. Now, we have the people assembled here from this notice to get a book, and also to hear what may be presented. I am going to leave it to you, that unless there is a good deal of tact used in the presentation of the subject of horticulture, they will soon begin to go out of the door. I have learned there are more ways to dismiss a congregation than by pronouncing a benediction. (Laughter.) In order to make the institute a success, I have made it a rule that it is always in order for people to go out of the institute whenever they please. I have sometimes told them the story of a friend of mine who said to me, one day, "Mr. Gregg, I don't like to go to church," and I said, "Why?" "Well," he says, "because that man stands up and jaws, and I can't jaw back." I tell them that it is proper to jaw back in an institute. (Laughter.) He also said, he didn't like to go to church because he had to stay until the thing was closed, but I tell them that it is always in order for them to go out of the institute room before the benediction is pronounced.

Now, bearing in my mind the fact that the majority of these people have no liking for horticulture, we aim to interest them in subjects of a different nature, as, for instance, many of you may have heard of our friend Theodore Lewis, a man from Wisconsin, who can talk "hog" and hold an audience as very few men can. Put Theodore Lewis on the platform and let it be understood that he is going to talk "hog," and let him have his pictures behind him—and there you have another powerful factor, we have held institutes when we could not have held them without pictures. I am not talking disrespectfully now, but I am talking of a class of people who are not interested in horticultural work. They have brains and power, but they are not interested in it. So, I say, hold them with hog, and I speak respectfully of hogs when they are sold at six cents a pound on foot, and going higher. I tell you, in all probability there will be a time this winter when we will put that hog on the platform to hold these people interested.

I was taken with a remark of the gentleman from Wisconsin, to the effect that you must get at the hearts of the fathers and mothers through their children. That is tact. Now, after you get these people interested in hog, what will you do? Well, I have intimated in institute meetings that we would very soon have a talk on sheep if they are sheep men. Now, you can put in a sandwich of horticulture between them, and they will take a little horticulture because of the sheep talk that is coming later. Sam Jones said one day, "Some people make sport of me because I make the people laugh; but when I get them laughing, then I lam in a rock." There is tact there, and I make this application of it to institute work, when I say that, when we get the hog door open we lam in horticulture.

Now, the next thing to be considered is, what sort of men shall present these subjects to them. These men are farmers, and they have their families to support and the dollars to look after. They have learned from experience that their dollars come from hay and wheat and cows. They know what a busy life it is. Now, if you put the subject of horticulture on the platform, and have a man speak on it who has the appearance of being from the city, while they will listen to him because they want to hear about the sheep later, they will discount everything he says.

And now I want to say to you that while you have always showed great wisdom in the selection of your assistants in this work, you have shown eminent wisdom in recommending Mr. William Somerville in this capacity. I have known him twenty years, and I have often said to him, "If you do the best you can, William, you cannot disguise the hayseed that is in you." Why, when he steps upon a platform there is not a man there who does not know that he is an old farmer; and when this institute learns that this man can run a farm and a garden, and raise berries and evergreens, and make a success of horticulture, it has been a matter of surprise to me to notice how much interest those farmers felt upon this subject, as they watched his words and took stock in what he said. And after he got through his first winter's work, I can say that in the track of the Minnesota farmers's institute meetings, there were springing up little patches of evergreens, berries, etc., and I can see that they are even taking hold of apples, although Mr. Somerville is exercising great care in this matter, being careful not to lay too much stress upon it.

Now, a word or two about your books. Beyond question you want such a book as you publish for yourself and your fellow horticulturist. But I do not think it is wise for you to attempt to send out your horticultural report to the farmers at large. You cannot hope to have enough to give one to everyone who comes in to our meetings, and the consequence is that there is always a feeling of disappointment among those who do not receive a book, even though they may not be interested in it. In this book of ours we try to have a good horticultural department. Our friend Smith says it is "line upon line, a little about strawberries, raspberries, etc." I am starting out this year to put in that book next year a few engravings, all that we can get. This is the kind of work that we want to do in the horticultural department of this state.

Gentlemen, I thank you for your patience in listening to me, and if there are any questions you want to ask me I shall be glad to answer them.

Mr. M. A. Thayer: I have had a little experience in this line of work at the farmer's institute. I am in charge now of one of the corps of workers in Wisconsin. Since the commencement of that work we have had in every institute a long session or talk on horticulture. Not one has been omitted, and we found very much interest taken in them. As suggested by my friend, Mr. Gregg, I think one of the strongest ways of presenting horticulture or any other culture is by illustration. Now, these maps I have here to-day were not manufactured for this meeting. I left home on my way to an institute the last of the week, and these are drawings that I use in presenting horticultural work to our farmers. I find it to be one of the most successful ways of presenting those topics to our people.

After each discussion I tell them that if they will give me their names I will send them a little pamphlet giving all the illustrations represented by those maps, giving them cuts of the different varieties of fruit, giving them the sketches of the farmer's model fruit garden, which I have made, and recommending exactly what they want to set out in that garden. At the meeting last Friday when I made that announcement, more than fifty came forward and requested that book. They became interested in it at once.

If I say to them that I produced three hundred bushels of blackberries from a single acre, as I did last season, if I tell them what I sold that product for, if I show to them that from a quarter of an acre of strawberries I received so much, if I say to them as I have in many cases, "I can produce a crate of ripe delicious berries ready for your family as easily as you can produce and deliver to me one bushel of wheat," it means something to them. They sell their wheat for sixty cents a bushel and come to me and pay me $3.00 a bushel for my fruit, and that means something to them. If I tell them that I am producing five or six or seven or eight or even nine hundred dollars' worth of fruit from a single acre, it sets them to thinking. If I explain to them that they have just as good land at their very door, and that with the same culture they can produce the same results, it sets them to thinking.

Of course, I never advise them to go into it for commercial purposes, but I say this: that I can grow berries ready to pick at two cents a box, and any intelligent farmer can produce them at a cost of three cents a box. Well, they begin to think of those things If I tell them that the expense of small fruit growing is not in growing the fruit, but in the picking, the boxes and the cases, in the express charges, and in the losses, they begin to see that they can begin to produce their berries at first cost, and have the most delicious fruit on earth ready at their own door.

Now, the true way to reach them, as I said before, is through illustration. We often have two or three different talks on horticulture, and we give one to the children. I give practically to the children of our state in the evening session very much the same talk I have given this afternoon. I give another one to the farmers in the afternoon, and so in two or three sessions we talk horticulture to our farmers; and I expect to follow that out as long as I am an institute worker.

Mr. Gregg: I do not want to leave the impression before this society that when I referred to our friend William Somerville and the personality that impressed itself so favorably upon farmers, that that was his

only stock in trade. Mr. Somerville is very apt as a teacher, and his presentation of the work is right in the line that Mr. Thayer has suggested. After he has stated in his plain, straightforward way what he has done, then perhaps Mr. Lewis will get up to the blackboard, which we have and to which every one has become accustomed, and show the farmers what he has done upon his hog farm in the line of horticulture.

Now, I have no criticism to make upon your report. I have come to be much interested in all its pages. But in my mind the great mass of our farmers have not yet become sufficiently interested in this matter to take the pains to go into all the little details that you do here in this meeting. Again, you are not able to furnish the necessary number of copies to go around, and, even if you were, I do not think it would be wise to spend the money in that way. In other words, we may say that the mass of the farmers are in the primary department of horticulture and are not ready yet for the fifth reader and higher mathematics.

Mr. Smith: I have had some little experience in that line and I agree with what Mr. Gregg says. I would also say that in the work of other horticultural societies there has been published what has been termed a primer of horticulture, which takes up the more important details of cultivation of the berries and the orchards, being a book of thirty-five or forty pages, which tends to explain the more common things in connection with this branch. I have mentioned this matter for the last seven or eight years in the annual meetings of the state horticultural society, and sometimes it seemed as if we were just on the eve of publishing a similar primer of horticulture. We have never done it, however, and I have hoped I would live long enough to help distribute a little book not to exceed fifty pages in size that could be printed by the thousand for distribution over the state of Minnesota.

Mr. Gregg: Allow me to suggest as bearing upon that matter, that I have often thought it would be a very good thing for you—I may be in error—to take the department of horticulture into your own hands. If action is taken this winter, as I hope it will be, we shall be in better shape by reason of the publication of that book than we have been in the past. Now, what will you gain by this. First, you will have it bound in substantial paper covers, and then distribution will be made with one move of your hand. In order to save confusion in our meetings we have always requested the members of the institute to remain seated while we are distributing our books, and thus you will see this can be done, as I said, with one move of the hand.

I am taking steps to have our farmers begin to save these books with the idea of making a library. No doubt you are as well acquainted with the facts as I am, that we are almost wanting in agricultural books. I can go into our public libraries and can find ten books on hunting dogs, where I can get one book on agriculture. I paid $25 for books this spring, and I will state here candidly that fifty per cent of those books were as worthless as a last year's almanac. They were obsolete. You who read the agricultural papers largely will bear me out in saying that we have often to wade through a great deal of stuff before we get a little information. So I am trying to make up a good library of agriculture that cannot be bought. To-day, right here in the nineteenth century, we who follow agricultural pursuits must face this fact, that we are following an occupation without a literature.

Mr. E. J. Cutts, of Howard, then read the following paper "Vine Growing in Wright County." (See index). This was followed by "A Woman's Experience in Vine Culture", by Mrs. Sophronia Irwin of Excelsior. (See index.) Mrs. Irwin's paper was listened to with great attention and at its close she was liberally applauded. A long and interesting discussion followed, at the end of which the society adjourned to meet at 7:30 P. M.

EVENING SESSION, 7:30, TUESDAY, JANURY 10, 1893.

The meeting was called to order by Pres. J. M. Underwood, who introduced Hon. W. H. Eustis, mayor of Minneapolis. Mayor Eustis stepped forward and welcomed the society to Minneapolis in the following words:

Mr. Chairman and ladies and gentlemen: It is a great pleasure for me to meet the representatives of the state horticultural society this evening. Now, I did not intend to make you an address, but somebody whispered in my ear some time ago, that having succeeded my distinguished predecessor, Mr. Winston, that I would be expected on this occasion to come before you and say you are welcome to the city of Minneapolis, and when this evening, at dinner time, I saw that I was booked for an address to you, I said that a cog had slipped somewhere. (Laughter.) I am here to say just a word or two to you.

I am glad to meet with you. It is a comfort and pleasure to turn in from the cold street without and come up here and find the palms all around, and the flowers blooming with fragrance, and the tables weighted down with the fruit of the soil of Minnesota. I have been pained ever since I came to the state, ten years ago to think we could not raise apples in the state of Minnesota. But, lo! the apple, my favorite fruit, is here. I remember, in old St. Lawrence county in New York, how my father tried to start an orchard of apples; year after year he would dig out the old and put in the new, but he never succeeded in raising any apples. I had an idea that Minnesota, being on about the same parallel as St. Lawrence, gave no promise of ever raising apples here. We used to raise apples in some of the counties in the state of New York, down in Geneseo and Rochester counties, but never in St. Lawrence county. Now, when I came to find the finest grapes I have ever seen raised here, right on the shores of lake Minnetonka, I could hardly believe my eyes; but it is true.

Now, if I were to select out any body of men and women in this state before whom I would stand to-night, I should select those who are here to-night. You are here as disciples of nature, because you are accustomed to think the great thoughts of nature. You are groping through the paths by the light of science, and by grafting and by pruning and by tilling, you are bringing out beauty in the lily, you are adding sweetness to the violet, flavor to the berry. That is more than Solomon could do. You do it because you have your ear close down to the great beating heart of nature and you are studying it. You think about these things

by day—it is the burden of your thoughts—and it is the essence of your dreams by night, how to produce some new variety. Now, then, such lives develop the highest manhood and womanhood.

I am glad to meet you to-night, you who hold communion with nature. That is all we are here for, to follow in the footsteps and find out the plans that the great Master had when he started vegetable life; to find out his ways and ascertain his thoughts; and when at last we have exhausted the laboratory of the great I Am, and ascertained the last secret of the vegetable and animal life, then it will be time for the end of time to come. We are marching on that highway and you are the pioneers, I might say, in this movement to a higher vegetable life, which means a higher animal life.

I am glad to say welcome to you in the name of the city. You are welcome to this hive of hospitality, and I will not shorten or weaken our greeting by making it long. You come to us and we give you the cordial greeting of citizens who appreciate your life and the work that you are doing. Our hospitality and our greeting is as sweet as the honey in the honeycomb that I saw in yonder room. I remember, as a boy, I used to sit down in my father's yard and listen and watch and wonder when the bees would swarm. Then, at last, I would hear the increasing murmur and see the increasing cluster, and I knew the old queen was moving, and soon they would take a bee line for some place. Then, how we would fool them with our mulberry stalks, and entice them to stop. (Laughter.) I am glad we have held out the mulberry stalks and have caught this hive of industry from all over the state and enticed it to light in this city for a period. You are welcome to our city and hearts and all that we have. (Applause.)

Response to address of welcome by Hon. Alfred Terry, Slayton:

Mr. President, Mr. Mayor and fellow horticulturists: Many of you will join with me, I know, when I say that we have very pleasant recollections of the past hospitality that we have always received from this city. This lends even a double charm to this welcome which we have just received from the mayor. (Applause) Many and many a time our society has received a number of invitations at the same time, and I know that Minneapolis has been placed where they have always felt that they could have an undoubted and unqualified welcome.

We recognize that in Minneapolis wonderful improvments have been going on in past years; we recognize nature's gifts, among them St. Anthony Falls; we recognize also that push, that energy, that determination of the citizens of this place. We also recognize that there is no invention of our times but what Minneapolis grasps after and places before our eyes. We recognize also that in hospitality she is second to no city in the world, and I shall be glad, with the rest of you, when I see that ship of defense of ours, which is soon to be launched upon the oceans of the world, I shall be glad, as I said before, to see that glorious vessel bear the great name of Minneapolis, and spread its renown from continent to continent. (Great applause.)

I know that we oftimes go back to our boyhood days and think of the pranks and tricks that we have played. We think of this, that and the other thing, but the thoughts are only for a few moments. Yet when we

think of the orchard, the grove, the flowers and the fruit upon the board, how we long to let those memories run on, and how we murmer unconsciously, "There is no place like home." It is a society like this that makes that home possible by its unwavering earnestness, fighting sometimes against nature itself and a new soil; meeting from year to year, after hard work and expensive toil, very often, to discuss and throw out to the people of the state the best way and the cheapest way that they can raise that without which I believe mankind is not happy.

As has often been referred to, even Horace Greeley said that no fruit could be raised in Minnesota, and yet we must remember that he always said, "Young man, go west." He should have recognized another thing: that God, when he made a place for man to live in, the first thing he did was to plant a garden and tell man to keep it and to dress it; and we, as horticulturists, both amateur and professional, are learning one from another how to keep it aud to dress it. One reason why we feel so welcome in Minneapolis, Mr. Mayor, is that you have in this city, what I believe very few cities have, boastful though other cities may be, well as they may have done, you have been fortunate in possessing a citizen who has had the proper estimation of the value of parks; and you have a system of parks which I believe I have never seen beaten in my travels. It may be beaten in size, but not in system. I believe myself that in those parks you have added, "A thing of beauty which is a joy for ever" to the city of Minneapolis and to the people of our state. I would make an assertion here and think I shall not be contradicted, that while we are glad to hear the buzzing of the machinery, while we are glad to see the cars running here without pulling or pushing, controlled by the electric current, still, at the same time it is a positive fact that you cannot make a man perfectly happy and contented without his grass and his fruit and his flowers.

I firmly believe that if the endeavors of our society could be carried out to the very utmost limit throughout the United States, so that we would see even the most ignorant farmer persuaded to plant his orchard and his flower bed, and his grove; I believe that as you give him those sources of true happiness, every uncalled-for strike would be done away with and happiness and contentment would take its place.

If you remember, the mayor alluded to the lily, and I will refer to the words of the Lord, when he spoke about the lily. He said, speaking of that which the Israelites counted the greatest of all beauty, "Solomon in all his glory was not arrayed like one of these." Remember, too, that when God promised the people of Israel the promised land, he could describe it in no other words that the poor Israelites could understand than to say it was "a land flowing with milk and honey," and the first evidence that he gave them to that his word was true, was a bunch of grapes from the promised land.

I tell you, you will find all through that Book of Truth that the evidences of true happiness came from the very industry of which we are now treating. We thank you, Mr. Mayor, for the kind hospitality you have tendered us, and in return we hope that in the way you have gone in the past you will so continue in the future, making park after park, that your residences may be surrounded with the orchard and trees and flowers, and at last Minneapolis shall become in fact like the place we have often heard about, the seventh wonder of the world, and you will have here a regular

Babylon with its hanging gardens. I will promise you in that case, that while your men will be turning the wheels of industry in other vocations all day, that at evening time they will go home contented men, satisfied with their wages, saying, "What more do we need for a happy home?" Applause.)

President J. M. Underwood then delivered the president's annual address as follows:

Ladies and gentlemen, members of the Minnesota State Horticultural Society:

Twelve long months have swiftly passed since our annual meeting in Owatonna, and my message to you is one of good cheer. I congratulate you on the prosperity that has attended all the past year, and I trust that not one of our number has failed to share in the bountiful harvest that Minnesota, as a whole, has enjoyed. Not only have the farmers been blessed with abundant crops and remunerative herds and flocks, but the artisan, the day laborer, and the kitchen servant, as well as all the varied interests of the town have, as a natural consequence, received a benefit.

As horticulturists, I think we are fully up with the procession. It took a good deal of scoring before we got a start, as is always the case when there are large interests involved, but the first quarter is past, and we have a good start on the second. Although the horse interests, led by the wonderful Nancy Hanks, may seem to have the advantage, lightning is playing sad havoc and has already knocked out the horses on the street cars and, as long as Edison lives, their whole fabric is in danger. From the hog and cattle interests, we have nothing to fear. Self preservation is fast causing people to turn from sausage, roast beef and grease to wholesome vegetables and delicious fruits. The doctors are experiencing a change of heart and, instead of beef tea, they give bean soup; instead of aggravating the stomach with roast meats, they soothe it with a raspberry shortcake, cream and sugar to suit the taste, and so, before the echoes of Christmas chimes and New Year greetings have died away, I wish you, one and all, an exceedingly happy new year.

RETROSPECTIVE.

Most fortunate, indeed, it is for us that the rest and quiet of winter is upon us, allowing us time to take our bearings and study our course. If the rapid pace of the summer months were kept up, we would sink exhausted or encounter breakers that would swamp our craft. I am told that in the south, where the battle of life is continually waging, they become indifferent, and cease to exert themselves at any time, although necessity demands vigorous application to business. A friend of mine visiting in southern California last spring found their houses and places of business cold and uncomfortable, except through a few hours in the middle of the day, when the mercury would rise to over ninety in the shade. Having occasion to patronize a barber shop in the morning, he was obliged to keep on his warm wraps, and the barber wore an overcoat and cap while shaving him. No stoves, and if they had them fuel was too dear to use, so they wait for the sun to warm them up.

In Minnesota, we do not wait for anything. In the winter we enjoy ourselves in our warm, comfortable houses, and in the summer, with renewed vigor, and accumulated energy we push the work we have planned. The winter of 1892 was, in some respects peculiar, it having

forgotten to rain during the fall, the ground was extremely dry when it froze up. To make amends there were three successive heavy rains in December, that largely overcame the drouth and disaster that must have followed had it continued dry through the whole winter. There was not much snow, but enough to protect the roots of most trees and plants, so that, as a rule, they came through the winter in excellent condition.

We can safely assert that there never was a more glorious springtime for planting trees, in fact, anything—an early and late spring combined and just moisture enough. It would rain and wet up the ground in nice shape, then wait until you had planted, and then rain again to give the new plants a start. Those that planted early, ordered more, while those who did not intend to plant, caught the infection and ordered, "to be shipped at once." Not satisfied with giving us a good start, Dame Nature accompanied us all summer with a watering pot and lavishly bestowed upon us the moisture that so rejoices the garden and orchard. As a result there were but few failures to live, and a splendid growth was made. Later in the season the fickle dame withheld her smiles and threatened to keep our grapes from ripening, but the sun kissed her into good nature again and overcame the coolness, so that every pound of the heavily laden vines was gathered and sent to market.

The past fall was dryer than we wish it had been, and the drought, which is accentuated by winter's cold, may cause us some loss. There is, however, a fine covering of snow and up to the present time there has not been any ridiculous caper cut by the mercury, while most of the time it has been just the kind of weather to delight the heart of old and young.

THE FRUITAGE.

The facts regarding our productions will no doubt be brought out during our session. I venture to predict that if there should be a correct statement made the most sanguine of us could hardly credit the amount of apples and small fruits that were raised in the state of Minnesota the past summer. I have taken pains to investigate, and I find that, besides supplying themselves, the farmers in the southern half of the state have taken to each of their several markets from one to several thousand bushels of apples. While in St. Paul last summer I was attracted by a large grain wagon filled with Duchess. A man in charge had driven onto a vacant lot, unhitched his team, and had four men carrying apples to the different houses, selling them at one dollar a bushel. He had bought them by the carload in Red Wing at sixty cents per bushel, and said he expected to get five or six carloads from the same shipper. Considering the disreputable way in which they were handled, the apples looked well, but to take apples to market in sacks, unload them into cars in bulk like potatoes, and to convey them to the consumer in the city in grain wagons, suggests a little missionary work on the part of our society. If apples were abundant, what shall I say of small fruits? Wherever set vines and plants were loaded with fruit. People, who ordinarily considered themselves fortunate to get one dish of berries a day, got two dishes three times a day, and a shortcake thrown in.

FUTURITY.

We have now come to compare notes and counsel with each other as to what we had best do the coming year. Our society has a grand mission to fulfill. It has already done a great good in fostering and encouraging

horticultural interests. Minnesota is known the world over as a wheat producing state, and the first thought of every one has been to furnish the staff of life, until with the modern appliances of gang plows, twenty-four foot seeders, self-binders at $100 apiece, threshers that feed themselves, sack the grain and stack the staw, wheat is brought down to the price of corn, and a man who has not the appliances for growing it had better let it alone. Coarse grains are cheap and can only be grown at a profit by the most skillful, if we except barley. If Uncle Sam ever goes out of the saloon business, I should say, if we, as individuals, ever acquire sense enough to quit it by refusing to hire saloon agents at $500 and $1,000 a piece, barley will not be worth raising.

There does not seem to be any line of business that offers better inducements than the garden and orchard. It is our duty to see that every one, young or old, rich or poor, is supplied with the freshest of vegetables and with the choicest fruits. Although some of us have all we want, and large quantities are put upon the market, the number who can afford them in their best condition is comparatively few. It is our duty to show producers how to place their products on the market in the best of condition, and the marketmen how to keep them until turned over to the consumer. Of course, fruit and vegetables from one's own garden are the best; but they can be handled so as to have them in the market nearly as fresh and good. Only the best of products should be placed upon the market; the second quality can be used for canning and drying, and the third grade thrown away. Nothing is so disappointing to the consumer as to purchase an article that is excellent, good and bad, all in the same basket. In your deliberations I trust you will develop the best way to bring about a reform in this direction.

BETTER METHODS.

Each year I am more firmly convinced that we need to adopt better methods and better culture. It is the most difficult thing we have to do along our road, to get out of the ruts. We gaze in wonder at the success of our neighbor, but seem wholly incapable of raising ourselves to his plane of action and adopting his methods; so we plod along in our old antiquated way. When I visit my neighbor and find him raising on a half dozen vines more tomatoes than he can use, and giving of his abundance to his neighbors, and he tells me that he has been having ripe tomatoes for two weeks, while mine are nowhere near ripe, why should I continue to plant a hundred vines in the old way? This fall a friend told me he was going to dig up three-fourths of his grape vines; he did not want so many; he had too much fruit; two or three vines is all he needs, as he gets from three hundred to four hundred pounds to the vine, while most of us get eight.

It is but a short time that we have been able to grow blackberries successfully in Minnesota, and only a few people now know how to do it. We have lost trees by the thousand and called it winter killing, but friend Somerville and others are mulching their orchards heavily, thereby retaining the moisture in the ground and proving that it is drought—a lack of moisture that causes the trouble and not the cold weather. Among the jars of fruit that Secretary Latham has put up for the Columbian Exposition, are several of peaches grown by different persons

around Excelsior. We are learning new and better ways of doing things, and here in our society is the place to bring them out and make them known to all. New varieties, adapted to our climate, are what we ought to encourage. We are particularly in need of a hardy, late-keeping apple. It can be produced by planting seeds, and I recommend that our society offer a reward of one thousand dollars to any one who will furnish an apple as hardy and good as the Duchess, that will keep easily in barrels in an ordinary cellar until the first of March. There is not one of us but would be willing to contribute liberally to the premium, and if the offer is made we will, in all probability, have it to pay. The tree may already be grown, or the seed from which it is to come may be in the fruit that is upon our tables. It is not necessary to be a professional to produce it. Any one can plant seeds.

This fall a young man in our employ called my attention to a tree that he had nursed from a seed. Eleven years ago this fall his father brought home from town some nice, large, red apples. The boy ate one of them and saved the seeds and planted them in a box. He got one tree. The father died, and, in his memory, he has cared for that tree, which is now producing large crops of beautiful apples. Cannot we encourage more of such work? The Iowa State Horticultural Society has bought seeds and distributed among its trial stations to be cared for. Cannot we do the same? Adaptation to circumstances is a law of nature. Everything else in Minnesota becomes hardy and adapted to the climate. Why should not fruit trees?

Our experimental stations are now under the direction of our central station, presided over by Prof. Green, and are sure to bring forth good results. It is our duty to supplement their efforts in every way that we can. Organized, intelligent application on their part is sure to bring to the state invaluable results and reflect much credit on our society that has caused them to be established.

INSTITUTE WORK.

There has never been any means of education introduced that has returned so large and good results for the money as the farmers' institute managed by Prof. O. C. Gregg. He has called to his aid a valuable corps of assistants. They have straightened many a crooked path and smoothed many a thorny way all over the state, while Prof. Gregg has shown them how to furnish the cream. Our venerable coadjutor, William Somville, has carried the gospel of success in horticulture to the listening crowds and demonstrated how to grow the berries. What more is needed? Only this: it requires "Line upon line and precept upon precept." It is our part in this society to gather them into our fold and give them the benefit of our discussions and experience. Every farmer, market gardener and florist in the state should become a member of our society and read our reports, if he can not attend our meetings. I think this should be one of the features of the institute work, to acquire membership to our society and distribute our transactions. Another plan I would suggest for acquiring membership is to have our secretary offer premiums of plants and vines to all members of our society for 1893—such premiums to be furnished gratuitously by the gardeners, florists and nurserymen of our state. It is a plan I cannot take the time to elaborate here, but is one that has been under advisement the past year and I am confident can be carried out with profit to our society and credit to all who participate.

This leads me to recur to the subject of a home. Several times I have urged it upon our society to get a home. There is not a "two-for-a-cent" society in the state but what has a home. "Ists," "isms" and fraternities of all kinds are no sooner born than they have a home, and here we are twenty-six years old and without a home. The necessities for one are increasing every day. Our membership is increasing and our secretary needs better facilities for doing the work. We should pay him a better salary and keep him at work all the time. It would be money in our pockets in increased membership and would give us an atmosphere of comfort that no one without a home can feel. A handbook of horticulture should be published, embodying the best that can be gleaned from our society reports and elsewhere, put in a condensed form, something like the valuable reports sent out by Prof. Green of the experiment station. It should be well bound and sold for the benefit of our society. The work should be done under the direction and supervision of our secretary and could be made to pay a revenue to the society.

FORESTRY.

I have intimated that one of the obstacles we have to overcome in horticulture is a lack of moisture, and I believe that this is going to be largely ameliorated by the work that is being accomplished by our state forestry association. The zeal and tenacity exhibited by its officers are good examples that younger men might well follow and can only be accounted for by the importance of the subject, which long years of experience have impressed upon their minds. While they may, they raise their warning voice and plead for the preservation of our forests and the setting aside of large tracts of country, not available for agriculture, as preserves for the growing of forests. Well may every farmer in Minnesota and the Dakotas supplement the work done by the forestry association by planting forests and shelter belts around their farms.

COLUMBIAN EXHIBIT.

Naturally enough we are all on the qui vive for the wonders that will be unfolded to us at the World's Fair. The Commissioners for Minnesota were handicapped by a lack of proper legislation. They were, after much delay, enabled to make the appointment of Supt. of Horticulture, and our interests are now well in hand.

I have thus far said nothing of the interests of our bee-men and florists. When a boy, my little cousin always ate his pie at dinner the first thing for fear he would be so full, if he ate his dinner first, that he could not enjoy his pie. Well, I never get so full of vegetables and fruit that I cannot enjoy some honey and revel in the beauty and fragrance of flowers. Minnesota has occasion to be proud of the way in which these interests are cared for. Progress and success are perched upon the banner of the bee-keeper, led by Messrs. West, Taylor, and Theilmann. One advantage their labors possess over others is that if they ever slacken their efforts the bees can easily stir them up and stimulate them to renew their energies. I am told that 300 tons of honey is a low estimate of the production for 1892.

The florist's interests in the state are doing splendidly. A taste for the beautiful is pervading the atmosphere of the rural home, as well as of that of the city. Large greenhouses, amounting to many acres of glass, are erected throughout the state and the business for the year amounts to about $400,000.00.

Ladies and gentlemen, I am proud to stand before you to-night and welcome all these important interests to this, our twenty-sixth annual gathering. May our deliberations result in great good to the many interests here represented and this annual meeting prove the most pleasant and profitable of any we have ever held.

Secretary A. W. Latham, of Excelsior, then read the secretary's annual report as follows:

SECRETARY'S ANNUAL REPORT.

Mr. President and fellow members of the Minnesota State Horticultural Society: The report which I have the honor to present to you this year, the twentieth published report of the transactions of this society, embellished at the head with the cheerful countenance of our ex-president, J. S. Harris, and the protrait of ex-Secretary J. W. Harkness, deceased, is a volume in some respects, at least in dimensions, the superior of that of last year, which was the first I had the pleasure of preparing for you.

This report contains 404 pages, an increase in size over last year of more than 22 per cent. The increase in the amount of material it contains is still greater, as a larger proportion of it is printed in brevier. The topical arrangement proved to be a convenience, and is continued in the present volume. It is not practicable to make a perfect classification; but an approximation to it is found to be a convenience in looking up any particular subject. Under the head of "General fruits," however is necessarily grouped information belonging under several special heads, which cannot well be separated without destroying the personalty of the reports. I have heard no criticisms on this method of arranging the report, on the contrary, from many sources commendation. It should and would be a pleasure to the secretary to receive suggestions and criticisms on this as well as any other of the work of the office, which might result in increasing the efficiency of his efforts. The usual number of reports, 3,500, was printed this year, of which 2,000 were cloth-bound, through the kindness of the gentleman in charge of the public printing.

MEMBERSHIPS.

The annual membership for the year just closed has increased from 222 last year to something over 300. The life members have increased in number four, three honorary and one paid, making the present life membership 42. The total membership for the current year is about 350. The continued growth of the society may be fairly taken as an index of the interest in horticulture throughout the state.

Our increasing strength may well be a source of pride to us. It is not the work of any one officer or member in any large degree, although several have contributed considerably to this result, but it is due to the general interest which the members have in seeing the society grow and its work extended. I have taken some pains to ascertain the facts, and, as far as I can learn, there is no state horticultural society in this country which has a stronger membership, and but few that have nearly the number. To make our record good this means that we must do unusual work and accomplish unusual results; and, certainly, in a community where there are so many obstacles to overcome and where horticulture enters upon a new and untried field, it is necessary that we should do earnest work. The necessity combined with the earnestness and intelligence of our people is the probable cause of the working strength of this

society. The question which as members of the society and practical horticulturists is pertinent is, how shall we still farther extend the work of our society, and foster an intelligent interest in horticulture in our community?

The work of the society consists in collecting facts as they exist, creating new facts through the medium of experiment, gathering these facts together by the aid of our organization, and finally placing this collection of facts, properly collated and arranged, before the people of the state. In short, our work is to gather together horticultural truth and scatter it broadcast. To accomplish this result this society has its committees whose work it is to present from time to time the truths both new and old relating each to his department. It has its experiment stations in different locations, soils and climates throughout the state for the purpose of testing systematically those things which are comparatively new or untried, with the purpose of learning the truth. Reports of these are also turned into the common treasury. Besides these sources of information we sit as disciples at the feet of the professors and other learned men of the land who come up to shed light upon the dark places of the Northwest. Here, then, are gathered together into one receptacle the dry facts that make up the annual gospel of horticulture. Mix all this with three times as much enthusiasm which glows in the words of those whose thoughts burn within and clothe these skeletons of fact with life and light, and the work of the society for the year has shaped itself to go before the people. Here, then, is the work prepared for distribution among the people where in large part the good results of the work of the society are yet to appear.

Certainly, a large part of the advantage of a horticultural association is found in the personal inspiration that those who attend its meetings carry away with them and in impart to others. Those who do not have the advantage of this attendance or of personal contact with those who have been present, come in touch with the society and the direct influence of its work only through the medium of its published reports or extracts from them. Of the limited number of reports published, aside from those that are distributed directly to the members of the society, probably a smaller number than we could wish go into the hands of persons who appreciate their value or make the best practicable use of them. That the society does collect and arrange in its report fairly well the current horticultural facts as they exist in the state from year to year, there is no question; and the problem that presents most difficulties in its full solution is how to distribute this information so that the best good may result.

It is certain that if all those whose pursuits or tastes lay in the direction of horticulture would unite with this society and attend its meetings the best results attainable would follow. This cannot be expected, but it follows that an increase of membership means an increase in all ways in the results desired. Many who would be glad to join our ranks know little or nothing of the society and its workings, or have a misconception of its personnel and its objects. Every possible means should be taken to inform the people of the facts in regard to the horticultural society, and urge the earnest co-operation of all interested in this work. The society should more extensively advertise itself and let it be generally known that this is an association not of office-holders, or amateurs, or of nurserymen, alone, but an association of the people and for the people.

The results of a short advertisement carried the past year for a few issues in some forty of the country papers of the state, was a large number of calls for reports, enclosing postage, and the accession of quite a number to the ranks of the society. A possible means of helping on this cause might be found in the selection of some state paper, which is strictly agricultural in its character, and making it the official organ of the society, through the columns of which notices of any character could be sent to the members of the society as well as given to the public, and any horticultural material of value in the possession of the society placed before its readers. The semi-official character of such a publication would enhance its value and to a certain extent serve the end of the society. Other local journals devoted to kindred interests might be used as a medium of scattering abroad the information this society is accumulating. The formation of local societies, or, as is done in at least one state, the formation of small boards of horticultural directors in each county as centers of information and activity are other means to this end. There are plenty of other ways in which this society might carry forward its work if the means absolutely necessary were provided, and it is hoped that the time is not distant when the lawgivers of our state, who have ever displayed a friendly interest in our work, will still further emphasize their appreciation of it by increasing the annual appropriation which enables it to go forward. Another thousand dollars yearly added to that now allowed would permit the adoption of many important facilities in doing our work.

EXPERIMENT STATIONS.

The systematic effort inaugurated two years since is ably seconded by the faithful efforts of the superintendents, whose detailed reports indicate the interest they are taking in their work. The central superintendent undoubtedly feels a satisfaction in the working of the system, but is hampered somewhat in his efforts by lack of the necessary means. Here is a good use to which a portion of an additional appropriation could be put, aiding the superintendent and his assistants in the very important field of experimental horticulture.

COMMITTEES.

Considerable change has been made the past year in the division of work amongst the committees. Some new committees have been created, others stricken out and still others consolidated or subdivided with the view of somewhat simplifying the work. The membership of the committees was also almost entirely changed, and a plan adopted providing for as far as possible a complete annual change in these committees, so that more of the members and all portions of the state may be in time represented in the various branches of the work. Nearly all the members appointed on these committees signified their willingness to accept the responsibilities of the positions. Society stationery, with the name of the committee and the name and residence of the committeeman, was offered to each member of these committees as well as to the officers of the society, and in many cases was accepted. The expense of this was small and probably not beyond the value of the advantage received. If any suggestion were to be offered at this time in connection with the committee work, it would be that the committees be decreased in size and no members appointed except those who signify a willingness to give the necessary attention and prepare written reports.

RESTRICTING THE WORK OF THE SOCIETY.

The time is not far distant, in the opinion of some of our people, when it will be found necessary to restrict in some degree the work of the society. At the outset, while the number interested in horticulture was few and there were many kindred interests unrepresented by organization, it was found necessary to invite all these friendly interests to insure the existence of the society; but at this time the horticultural society, having some years since passed its majority, and finding the ground it is attempting to cover in its work occupying more time and space than can well be spared, the question of contracting its field must soon be seriously considered. Forestry and bee culture are already represented by strong societies; and there are other general subjects akin to horticulture that take up considerable needed time that may easily in some degree be set aside in the increasing interest in pomology and floriculture in our state. Personally, the secretary has no plan or wish in this matter, except to carry out the purpose of the society and increase its usefulness in the special fields that are most nearly connected with its purposes.

SUMMER MEETINGS.

I desire to take this opportuniy of saying a word complimentary of the friends of horticulture at Lake City, as I am aware the modesty of our honorable president will not permit him to do so. The friendly character of our reception there at the last summer meeting, and the jolly good time those of us who had the good fortune to be present enjoyed will long linger a fragrance in our memory. Whether or not the Lake City people are good horticulturists we had not the opportunity to learn, but to know how to entertain a good horticulturist is a lesson I am sure they have most thoroughly studied.

DEPARTMENT OF AGRICULTURE.

At the solicitation of our executive board Mr. J. S. Harris was a second time appointed a special agent of the department to look up the pomology of the state, and we may look for something new and interesting from him in this direction. The department in a very practical way is taking hold of the vexatious problems of horticulture and pushing them to a solution.

WORLD'S FAIR.

The special report which as superintendant I shall present on the subject takes the place of any long reference to it at this time. I will only say that my relation to the society as secretary is proving a great advantage to me as superintendant of the Minnesota horticultural exhibit at the World's Fair. To have the machinery and the prestige of the official position is of very great value, and the heartiness with which the fruit growers all over the state have taken hold to assist me as an officer of the society in getting up this exhibit is indeed a gratifying indication of the confidence and interest which is felt in the general work of the society.

STATE FAIR.

That our people made an exhibit at the last state fair with which we may well be pleased many of us personally know and all of you may see by examining the photographs now upon these walls, which were taken the day before the close of the fair. There is plenty of fruit in this state to make a fine annual exhibit if it can be gotten out, and to do this there

should be some important changes made in the premium list. A larger number of premiums offered for collections would encourage more of the smaller growers to incur the expense and trouble of making an exhibit with a reasonable prospect of being remunerated. With only two premiums for collection there is no encouragement for competition as it is well known who in each class will secure the premiums. A re-arrangement should be made that will bring new forces to the front. In one state, Nebraska, I think, the agricultural society allows the horticultural society $1,000 for premiums at the state fair and leaves the arrangement of premiums with them. We should seek further recognition in this direction, and by proper management can easily make an exhibit of the various horticultural products that will tax the resources of horticultural hall.

AMERICAN HORTICULTURAL SOCIETY.

Mr. Wyman Elliot and myself were appointed by the executive committee delegates to the meeting of the American Horticultural Society, held in Chicago, Sept. last. In the point of numbers this was not a large meeting, but those in attendance in the main were the enthusiastic and practical workers in the extensive field which the scope of the society covers, and the report when published will be one of the most valuable additions to our horticultural literature.

It will not be best for me to take up your valuable time in describing minutely this interesting meeting, and, instead, I refer you to their forthcoming report. A pleasant feature of the three days' session was the courtesy extended to the society by the World's Fair management, in carrying us to and through the grounds and buildings of the exposition and, especially, the horticultural buildings, where at that time were already collected large numbers of beautiful and extraordinary specimens of tropical plants.

The American Horticultural Society is evidently not in official touch with the state horticultural societies, a position which it would seem natural and reasonable for it to occupy. As far as I had opportunity to learn, we were the only regularly appointed delegates from a state society in attendance. That society is much crippled by lack of means to publish its exceedingly valuable report, which has not been done now for several years. Contributions were solicited to accomplish this purpose and a number of the members present pledged $10.00 apiece. The unfriendly relations existing between demand and supply in my finances, interfered with my assisting in this direction any farther than the annual fee of $2.00 as a member of the society, and, unfortunately, for the credit of our society Mr. Elliot did not happen to be present at that meeting; but I offered to bring the matter to the attention of this society, with the belief that we should be willing to assist in the publication of these reports. An additional interest would be created in this society by making it a center of relationship with local and state societies, and combining with the present useful work a discussion of questions relating to the welfare of the societies at large throughout the country.

REVIEW OF THE FRUIT CROP.

Minnesota has reason to congratulate itself on the comparatively excellent crop of fruit ripened the past season.

The small fruit crop was generally good and proved satisfactory. Even the grape crop, though three weeks late, by reason of unusually warm

weather and prolonged exemption from frosts, was ripened in full and placed upon the market. In apples our state has made for itself this year a record as an exporter.

The industry of growing apples has evidently obtained a permanent foothold in Minnesota, and we may confidently expect at no distant date that the apples stored in our cellars will be home grown.

FINANCIAL REPORT.

RECEIPTS.

I have the honor to submit the following financial report for the year.

Annual membership fees for 1891	$5.00
Annual membership fees for 1892	288.00
Annual membership fees for 1893	27.00
Life membership fees	15.00
Total	$335.00

DISBURSEMENTS.

Postage	$125.54
Printing, stationery etc	63.40
Express and freight on reports etc	18.46
Expenses to American Horticultural Society	35.35
Library, shelves, binding, rent etc	50.32
Photo-engravings	14.25
Sundries	20.73
Balance paid to treasurer	6.95
Total	$335.00

OBITUARIES.

The only death in our society the past year, which has come to my notice, is that of Mr. Sam. Partridge, assistant secretary of the state agricultural society. His obituary will be found in the usual place. I wish to emphasize here the friendship that Mr. Partridge always showed towards this society. In his special position he had frequent opportunity to serve the society, and it was always his pleasure to take thoughtful care of our interests. Those of us who attend the state fair will miss especially the kindly words and cheerful assistance accorded by Mr. Partridge. In his death this society has lost one of its best and most useful friends.

ORANGE JUDD.

It is sad to record the death of Orange Judd, whose connection with the agricultural press during a long period of years has made his name a household word. The journal which Mr. Judd had been conducting in Chicago, and which was turned over to his son, Jas. S., only a few days before his sudden death, was, of all the agricultural papers within the range of my acquaintance, most in sympathy with the work of the horticultural societies of the West, and had become, to quite an extent, almost their official organ. The Orange Judd *Farmer* has said many kindly things of this society, and its members, and in the successor of Mr. Judd, his son, whom many of us met at the last state fair, we may expect a continuation of this friendly interest in our doings and welfare.

CONCLUSION.

This report closes the second year of my connection with this society in the existing official relation. An acquaintance of twenty-four years with you led me to expect good treatment in this position, but the kindness

and thoughtfulness shown toward me in all directions and at all times much exceed my expectations, and have made my work an easy and pleasant burden to carry.

A noticeable thing in connection with this society is the marked absence of the elements of discord and a hearty willingness to work for the general success of the cause, not using the society as a means of accomplishing a personal end. While this spirit prevails in our ranks we shall go on making a record which will continue to be a cause of honest pride to ourselves and our successors in this useful field.

Respectfully submitted, A. W. LATHAM, Secretary.

ANNUAL REPORT OF THE TREASURER, DITUS DAY, FARMINGTON.

1892.	RECEIPTS.	
Jan. 22.	Balance on hand	$145.30
" 26.	Received from state treasurer one-half annual appropriation	500.00
July 18.	Received from state treasurer one-half annual appropriation	500.00
1893.		
Jan. 10.	Received from the secretary, membership fees in 1892	335.00
		$1,480.30
1892.	DISBURSEMENTS.	
Jan. 22.	M. Cutler, expenses as ex. com	$6.70
" 22.	J. M. Underwood, expenses as ex. com	3.20
" 22.	L. H. Wilcox, expenses as ex. com	5.00
" 22.	O. F. Brand, expenses as ex. com	1.54
Feb. 5.	E. A. Cuzner, salary as librarian	10.00
" 5.	Dewain Cook, ex. as del. to S. D. Hort. Society	19.53
" 5.	F. C. Metcalf, desk for library	10.00
" 5.	Wyman Elliot, express on reports	2.77
Jan. 22.	J. S. Harris, expenses as ex. com	19.64
" 22.	Ditus Day, expenses as ex. com	4.00
Feb. 5.	Ditus Day, salary as treasurer	25.00
" 5.	Wyman Elliot, salary as president	25.00
" 5.	A. W. Latham, 4th quarter salary for 1891	125.00
" 5.	Wyman Elliot, rent of office for library from Dec. 1, to Feb. 1.	15.00
Jan. 22.	Premiums awarded at the winter meeting of 1892, held at Owatonna, (See premium list as awarded)	113.00
Feb. 16.	Dewain Cook, expenses as vice-president at annual meeting held at Owatonna	3.70
" 16.	E. H. S. Dartt, expenses as delegate to Wis. meeting.	14.00
" 16.	J. H. Savage, reporting annual meeting	76.00
" 16.	L. H. Wilcox, expenses as ex. com	2.15
" 16.	J. M. Underwood, expenses as ex. com	3.00
" 16.	J. S. Harris, expenses as ex. com	8.15
" 16.	O. F. Brand, expenses as ex. com	3.54
Apr. 19.	A. W. Latham, 1st quarter's salary	125.00
July 19.	Premiums awarded at summer meeting, held at Lake City, July 19, 1892	76.50
" 19.	A. W. Latham, 2nd quarter's salary	125.00
Sept. 8.	J. S. Harris, expenses as ex. com	19 85
" 8.	Ditus Day, expenses as ex. com	8.11
" 8.	O. F. Brand, expenses as ex. com	3.32
Oct. 9.	A. W. Latham, for mimeograph	15.00
" 11.	Elliot & Metcalf, rent of room for library	15.00
" 17.	A. W. Latham, 3rd quarter's salary	125.00
1893.		
Jan. 10.	Expenses of secretary's office for 1892	328.05
	Total	$1,336.75
	Balance on hand	143.55
		$1,480.30

The report of the Assistant Librarian, Mr. E. A. Cuzner, was read by Secretary A. W. Latham, in the absence of Mr. Cuzner (*See index*), Mr. Latham following it with his report as librarian of the society." (*See index*).

An interesting paper was then read by Professor S. B. Green of St. Anthony Park, entitled "What we know of the Effects of Electricity on Plant Growth." (*See index*)

The president then announced the following committees:

Committees on awards—on apples, S. D. Richardson, and Clarence Wedge; on grapes, E. J. Cutts; on honey, Mrs. J. W. Blackwell; on flowering plants and cut flowers, Mr. and Mrs. Williams; on vegetables, William Lyons; on pantry stores, Mrs. Jennie Stager and Mrs. E. Cross.

Committee on suggestions for the good of the society, L. R. Moyer, Mrs. A. A. Kennedy and Alfred Terry.

Committee on president's address, C. L. Smith, Miss Sara M. Manning and Prof. S. B. Green.

Committee on obituaries, Col. J. H. Stevens, Dr. M. M. Frisselle and J. S. Harris.

Committee on final resolutions, Clarence Wedge, Mrs. Jennie Stager and O. F. Brand.

The society then adjourned until 9 o'clock the following morning.

SECOND DAY.

MORNING SESSION, WEDNESDAY, JANUARY 11, 1893.

The meeting was called to order by the president, and prayer was offered by Mr. Clarence Wedge of Albert Lea.

This was followed by the report of Clarence Wedge, a member of the committee on apples (*See index*). A long discussion followed.

Mr. R. C. Keel of Rochester also submitted his report as a member of the same committee, and a prolonged discussion followed. (*See index*).

Mr. J. S. Harris of La Crescent followed with his report of committee on seedling fruits (*See index*); and this was followed by report of committee on general fruits, submitted by Mr. Alfred Terry of Slayton (*See index*).

Mr. S. D. Richardson of Winnebago City and Mr. B. C. Yancey of Edina Mills, members of the same committee, also submitted reports (*See index*) which provoked a lengthy discussion.

The society then adjourned until two o'clock.

AFTERNOON SESSION, WEDNESDAY, JANUARY, 11.

In the absence of the president, Vice-President Clarence Wedge called the meeting to order.

The first report submitted was that of C. W. H. Heideman of New Ulm, a member of the committee on plums and cherries (*See index*).

This was followed by report of O. M. Lord of Minnesota City on the same subject, which was read by Secretary Latham in the absence of the writer (*See index*). Considerable discussion followed of an interesting character.

Mr. R. C. Keel of Rochester here read his paper entitled "Hardy Apples in the Northwest" (*See index*). This paper was followed by a long and interesting discussion, after which Mr. O. F. Brand read his paper entitled "The Leaves of our Hardy Trees" (*See index*), which also provoked considerable discussion.

Mr. L. H. Wilcox then submitted his report as a member of the committee on fruit blossoms (*See index*), and Mr. C. W. H. Heideman tendered his report on the same subject. (*See index.*) It was followed by a lengthy discussion.

Mrs. Jennie Stager, one of the vice presidents of the society, then read her report (*See index*), after which the society adjourned until 7:30 P. M.

EVENING SESSION, WEDNESDAY, JANUARY 11.

Meeting was called to order at 7:30 P. M. by Vice-Pres. J. H. Stevens, who addressed the society as follows: "Ladies and gentlemen: The exercises of the evening will be wholly upon the subject of forestry. I apprehend that you will agree with me that no one subject is fraught with so much benefit to the counrty as the subject of forestry. Without the trees, without the deep green woods, we would soon become a blighted, barren wilderness, incapable of producing any vegetation whatever. We should soon be a burnt and barren waste. This society is attempting to encourage the growing of trees, They are taking every precaution they can within their means to accomplish this object."

"We have a very distinguished gentleman from abroad with us to-night, and I trust he will address you, and I have no doubt that you will be interested in what he says. The first thing

upon the program will be the reading of letters and telegrams from absent members and others, which have been received by the secretary."

Hon. J. O. Barrett, of Brown's Valley, the secretary of the State Forestry Association, then read the following telegram:

EAU CLAIRE, WIS., Jan. 11, 1893.

To J. O. BARRETT, *Secretary Forestry Association:*

Illness prevents meeting with you. Would impress the importance to Minnesota and the adjoining prairie states of withdrawing five million acres of non-agricultural forest land in northern Minnesota, under proper care for the sale of grown timber; thus holding values in the state, maintaining water supply, navigation, preventing forest fires; thus doing what Europe has been attempting through three hundred years. Don't de lay till too late. Citizens of Minnesota will yet demand this.

H. C. PUTNAM.

A letter from Prof. W. J. Beal, Michigan Agricultural College, was also read (*See index.*)

Col. J. H. Stevens then introduced the speaker of the evening, Prof. B. E. Fernow, Chief of Forestry, Washington, D. C. Prof. Fernow received applause as he stepped forward and delivered a long and interesting address which will be found under the general head of "Forestry." (*See index.*) A long and somewhat varied discussion followed, after which the society adjourned until Thursday morning.

THIRD DAY.

MORNING SESSION, THURSDAY, JANUARY 12, 1893.

The meeting was called to order at 9 o'clock by President Underwood. The first paper submitted was that of Mr. Dewain Cook, of Windom, as superintendent of the Windom experiment station (*See index*), and this was followed by a similar report from C. W. H. Heidman, of the New Ulm experiment station. (*See index*).

Col. J. H. Stevens at this point called the attention of the societies to the articles in the morning papers in which the state horticultural society was made to appear as favoring the shooting of the robins when they interfered with their fruits. The Colonel stated that he was very much opposed to such matter going forth under the sanction of the society, and wound up by declaring himself a friend of the robin, and threatening to prosecute anyone he caught shooting them. This provoked

considerable discussion, which was finally ended by Mr. Heideman declaring that he would introduce a resolution later in the session covering that point.

The society then resumed the discussion of the above reports, and at the close of same, Mr. C. L. Smith moved the sending of the following telegram to the Nebraska State Horticultural Society, in session at Lincoln, Nebraska: "Nebraska State Horticultural Society, Lincoln, Nebraska. Minnesota Horticultural Society sends greeting and ice for lemonade. (Signed) M.S.H.S."

Motion seconded and carried. President Underwood then read a letter of invitation from Mr. and Mrs. Dorilus Morrison, inviting the members of the society to Rose Villa on Friday evening, Jannary 13, 1893. The invitation was unanimously accepted by a rising vote.

Mrs. J. W. Blackwell then submitted her report of committee on apiculture (*See index.*) After the reading Mr. J. P. West of Hastings, president of the State Bee-Keepers' Association, was introduced to the society by Prof. S. B. Green, and made the following remarks:

"Ladies and gentlemen: I supposed that this meeting was to be a meeting of the horticulturists and bee-keepers together, and that matters pertaining to both would be discussed. I am not a horticulturist in the full sense of the term, but I am interested in the matter as much as anybody in the state. I have bought fifty acres of land near Hastings and I propose to set out some fruit, and the great question with me is what to set out. I intended to be present at the horticultural meeting so as to hear all the discussion and decide what to do. I have decided among other things to raise some apples.

There are some questions which interest the bee-keepers and the horticulturists, and one that I would like to see discussed is this—the time and manner of spraying fruit trees. Now I saw in the last American Agriculturist, or in next to the last one, that bees were said to be injurious to fruit. A man in Virginia claimed that the bees ate up all his peaches. Now, I claim that every horticulturist should be interested in bee-keeping—that is, be interested so far to desire to have bees enough in his locality to fertilize his fruit. I was talking with a gentleman last November,—the county superintendent of Kittson county,—who is in a locality where he has to fertilize all his cucumbers and squashes by hand in order to get fruit. I suggested to him that he get a swarm of bees. He did so and it proved to be successful.

Now this matter interests me, as well as the subject of spraying, the time of spraying trees; whether the trees should be sprayed before or after the blossoms fall off. I was reading that no apple trees should be sprayed until the blossoms have fallen off, and that fruit with stones, plums, etc., should not be sprayed until the stone is formed, and until the fruit is as big as a pea or something about that size. I hope these matters will be brought up at a proper time.

My business is such that it has been impossible for me to prepare an address. I would like to have done so but my business is increasing all the time and the only time I have had to think about this address has been while I was riding on the train, but I am as much interested in horticulture now as anybody.

I saw in this morning's paper a discussion of this disease, heart failure. Now if I were going to advise anyone where to go to escape that dread disease, it would be to get out of the office and go to work on the land. There is no more prosperous business on earth nor more conducive to happiness than horticulture. I have been told that there are people in Minneapolis who steal because they cannot get any work and they want to get into the workhouse. A gentleman from Minneapolis,—a single-tax man by the way—claimed that there was no work for the young men in your city, that there were so many of them in Minneapolis that they had to steal and get into the workhouse where they would be taken care of. My advice to them would be to get out and get a piece of land and cultivate it. That business has never been overdone in this state. The tendency of to day is for people to go into our large cities. The last census shows that to be a fact. I see in the morning's paper that some of your members declared yesterday that a man with two acres of land will get more money out of it if he raises fruit than if he cultivates ten acres of wheat That is very good.

There is another matter against which I wish to enter my protest, and that is the shooting of the poor robins. I am a friend of the robin. Last summer I was in the habit of scaring away the birds who raided my gardens, but one day I discovered a crippled robin—he had a broken leg—and I let him alone (Applause).

I have been thinking lately it would be well, perhaps, to amalgamate these two associations. I do not know that it can be done, but it seems to me that there is so much of common importance to both that it would be well (Applause).

Mr. C. C. Aldrich of Morristown then read his paper "Suggestion to Beginners in Beekeeping." This was followed by a general discussion on bees and bee-keeping, after which the society adjourned to meet again at 2 o'clock.

AFTERNOON SESSION, 2 P. M., THURSDAY, JANUARY 12.

The meeting was called to order at 2 p. m. by President Underwood. The opening report was that made by Col. J. H. Stevens, vice-president, fifth congressional district (*See index*). Mr. Dewain Cook then submitted a similar report from the second district (*See index*).

Mr. O. F. Brand notified the society that he would propose an amendment to article three of the constitution on the following day.

The committee on award of premiums then submitted the following report (*See index*).

Mr. J. S. Harris of La Crescent, of the committee on apples reported that the display was a most creditable one, not only for Minnesota but for any other northern state this year.

"There is" he said, "a very large variety of fruit. The exhibit of seedlings is larger than we ever had before and more exceptionally fine varieties are shown than ever before. There are, perhaps, a dozen seedlings here of exceptionally fine quality. They would compare favorably with our magnificent Wealthy apple. There is one variety on exhibition from Cottonwood county, which is a remarkably productive variety. The quality is good, and the wood exhibited with the fruit would show that it is hardy. It has one merit and that is that it will probably keep all winter. The committee are unanimous in commending the fruit exhibit and other exhibits upon this occasion as being a credit to the society and the people of Minnesota. There are sixty-eight plates and a number that are not on plates, and some plates have several varieties. There are enough apples exhibited to make about two hundred plates. Counting in the seedlings and all, I should think we have about fifty varieties in all represented. There are over twenty varieties of seedlings here. (Applause)."

Secretary Latham then read the following letter from the president of the South Dakota Horticultural Society.

FORESTBURG, S. D., Jan. 9, 1893.

A. W. LATHAM, *Secretary Minn. State Horticultural Society*, Excelsior, Minn.

DEAR SIR: Let me, through you, thank the Minnesota society for the annual reports sent us. They are becoming a "standard text book" with us on horticultural matters.

Let me also thank your society for sending Hon. C. W. H. Heideman as a delegate to our annual meeting. He is a gentleman that we were all glad to meet and the longer we were with him the more we thought of him. Minnesota is doubly blest in such scientific horticulturists, and South Dakota will at all times have a warm welcome ready for him.

I am sorry that we are unable to send a delegate to your society this winter; but as you know, we are so hampered for want of funds that it is impossible. We live in hopes that time and the legislature will change all this, and then we will endeavor to repay your society in a measure for their numerous favors.

With best wishes for a pleasant and profitable meeting I remain

Yours truly,

H. C. WARNER,

President.

Mr. Clarence Wedge then submitted his report as a delegate to the Iowa State Horticultural Society. (*See index.*)

Mr. C. L. Smith, chairman of the committee on president's address, made the following report:

Committee on president's address report the following items that seem to call for special attention:

We should emphasize the fact that drouth, rather than low temperature, kills trees and plants.

We endorse the suggestion that more attention be given to the general planting of seeds of all our fruits.

We commend the plan of offering premiums for members and suggest that the matter be referred to the executive committee with power to act.

We heartily favor the idea of a permanent home for the society and suggest the selection of a special committee of three to take the matter in hand and endeavor to secure such a home, subject to the approval of the executive committee.

The handbook of horticulture is one of the necessities of the hour and should be published as soon as practicable, and the executive committee should be instructed to take such action as the funds of the society will justify.

S. B. GREEN,
SARA M. MANNING,
C. L. SMITH.

The report was unanimously adopted.

Mr. C. W. H. Heideman then submitted his report as a delegate to the South Dakota State Horticultural Society. (*See index.*)

The annual report of the executive committee being called for, Mr. Wyman Elliot stated that the committee had not prepared any written report, as they thought the secretary had covered the ground very thoroughly in his report. He said that no meetings of great moment had occurred during the past year, but he hoped the members of the executive committee would be so located in the future that they might be brought together without being put to the expense which they now incur when attending the meetings. Mr. Elliot praised the work of the present secretary very highly and said that he left but little for the executive committee to do, as he had taken the burden of the work upon his own shoulders.

Mr. J. A. Sampson of Excelsior inquired whether the executive committee had taken any steps toward utilizing Mr. Thayer's proposition made at the last annual meeting, and Mr. Elliot replied that nothing definite had been done, but that the committee would look into the matter the coming year and see what was best to be done, adding that he had no doubt some action would be taken on it.

Prof. S. B. Green then tendered his report as superintendent of the central experimental stations. (*See index.*) The paper was listened to with interest and provoked considerable discussion.

In the course of the discussion, Mr. J. S. Harris of La Crescent, moved that the members of the society be requested to send their photographs to the secretary, and that they be kept on file at the society headquarters, including the photographs of the old members of the society who performed work in this line in the past.

The motion was seconded and unanimously carried.

President Underwood then read the following letter from Mrs. C. O. Van Cleve.

MINNEAPOLIS, MINN., January 11, 1893.

PRESIDENT UNDERWOOD,

DEAR SIR: I regret exceedingly that my impaired health, and almost total deafness prevents my attendance at the horticultural meeting now in session in Minneapolis. I read the proceedings as published in the daily papers and trust that this will be a pleasant and profitable session. Soloman, who is called the wisest man, in recounting what he has done, says, "I planted me vineyards, I made me gardens and orchards, and I planted trees in them of all kinds of fruits," and we have reason to believe that he realized more pleasure from his horticultural experiments than from many enterprises in which he was engaged. And our Savior's beautiful allusion to the lilies, "which toil not, neither do they spin," is an inspiration to all who cultivate the lovely flowers that yield such large and satisfactory returns.

As from year to year you come together to exchange ideas and learn how best to care for and cultivate the fruits and flowers, you gather strength and encouragement to go forward and strive for still greater success, and can say with the representative of a very ancient horticultural meeting, "and they took of the fruit of the land in their hands and brought it down unto us, and brought us word again and said, 'it is a good land which the Lord our God has given us.'"

Wishing you continued and ever-increasing success in your praiseworthy efforts to develop and inspire the great capabilities of our beloved state,

I am very cordially yours,

C. O. VAN CLEVE.

Mrs. Jennie Stager of Sauk Rapids offered the following resolution:

"*Resolved*, That the members of the Minnesota State Horticultural Society present a bouquet of the flowers now on exhibition at its twenty-sixth annual meeting to its fellow member, Mrs. General C. O. Van Cleve, to express to her the kindly thoughts and wishes of this association, and

Resolved, That the lady members be appointed a committee and present the same bouquet to which was awarded first premium at this meeting."

The motion was seconded and unanimously carried by a rising vote.

The following letter, from the board of mangers of the Minneapolis Exposition, was read:

MINNEAPOLIS, MINN., Jan. 12, 1893.

MR. J. M. UNDERWOOD, *President State Horticultural Society.*

DEAR SIR: As the Minnesota State Agricultural Society has definitely decided not to hold a fair in 1893, and as the Minneapolis Industrial Exposition Association has decided to hold an exposition—opening September 6th and closing October 7th—which promises to excel all held in the past, we feel that it would be eminently proper for us (in the absence of a state fair) to enlarge upon our line of exhibits, and include the horticulturist of the state, believing that an exhibit such as you could and would make with the proper incentive in the way of liberal premiums would prove a great attraction to our coming exposition, and result in great benefit to the individual exhibitors.

This matter has not yet been presented to our board, but, if favorably received and considered by your society, I would suggest that a committee familiar with the details of such exhibitions be appointed to confer with our board with regard to same.

Trusting this may meet with your approval, I remain,

Respectfully yours,

W. M. BRACKETT, General Manager.

On motion by C. L. Smith, a special committee of three was ordered to be appointed by the executive committee from their number to make such arrangement with the exposition authorities, subject to the approval of the executive committee in regard to exhibition and premiums, as they could. The motion was amended and carried making the president of the society one of that committee.

President Underwood then read a letter from Mr. G. W. Fuller, written from California.

ONTARIO, CAL., Jan. 5, 1893.

My Dear MR. UNDERWOOD: I received your letter and the program for the next meeting of the horticultural society. I am sure, from the bill of fare offered, that you will have a good and profitable time. It is twenty-one years ago that I attended the first time, and I have missed but few sessions since when I have been in the state.

The history of fruit growing in Minnesota has been a checkered one; but a few years past has been somewhat more favorable, and it may be a few of the Russians have come to stay. My Hibernals did exceedingly well this last season, and the fruit is choice for cooking.

The contrast between our state and this is great. The orange and lemon trees are full of fruit, and it is ripe enough to begin to market it. It will be gathered from now on, most of it before April. Some 1,312.000 pounds, or 4,600 carloads of lemons and oranges, have been shipped from this state the past year, mostly from three southern counties, and yet there is no end to the new plantations that are being set. And the peaches, prunes, pears, olives, nuts and other varieties of tropical fruits are largely cultivated. Sixty-five millions of pounds of dried fruit and fifty-seven millions of pounds of raisins, to say nothing of green grapes and canned fruits, were sold during the past year. And this whole trade has grown up within the past twenty years; and it looks as if the ratio of increase might continue indefinitely. Will the demand be equal to the supply? One of the best and most fruitful of oranges was supplied by the government, sent from some foreign country. It is the "navel," a seedless orange. And I see now, out of my window, trees of this variety, only six years from the setting, loaded to the ground with this rich golden fruit. It is now nearly ready for marketing.

I suppose our "banana belt" will be hardly able at present to compete in growing these varieties of fruits; and yet we are able to grow what will enable us to place these fruits on our tables. And I am not yet prepared to say that I would be willing to exchange the advantages of the North Star state for those of the state of the Golden Gate.

Please give my kindly greetings to the members of the Minnesota Horticultural Society, with the earnest and hearty wish that the society may be increasingly useful in developing fruits that can be successfully and profitably grown in Minnesota.

Very respectfully yours,

GEO. W. FULLER.

Mr. C. L. Smith moved that the secretary be instructed to return to Mr. E. Wilcox many thanks for his photograph and the work he has done in the past for the society and the cause of horticulture, together with many kind wishes for his future.

Motion was seconded by Col. J. H. Stevens, and unanimously carried.

On motion the society then proceeded to the annual election of officers. On motion of Col. J. H Stevens, unanimously car-

ried, the secretary cast the ballot of the society for President J. M. Underwood as president of the society for the coming year.

Mr. Underwood returned his thanks to the society, saying that he appreciated the courtesy and honor bestowed upon him. "I only hope," he said, "that I am entitled to the recognition you seem disposed to give me. I feel, perhaps, as though you do not know what is for the best interests of the society, or you would have elected Mr. Wyman Elliot as your next president; but I think your hearts are all right. (Applause.) I will do my best in the future, as I have in the past, to serve you. I thank you very kindly for the favor you have conferred upon me."

The following officers were elected in the same way, the vote in every case being unanimous: Vice president for the First Congressional District, Clarence Wedge, of Albert Lea; Second, S. D. Richardson, Winnebago City; Third, L. E. Day, Farmington; Fourth, R. S. Mackintosh, Langdon; Fifth, Col. J. H. Stevens, Minneapolis; Sixth, Mrs. Jennie Stager, Sauk Rapids; Seventh, J. O. Barrett, Brown's Valley.

On motion of Mr. J. S. Harris, unanimously carried, the president cast the ballot of the society for A. W. Latham of Excelsior as secretary for the coming year.

The treasurer, Mr. Ditus Day of Farmington, was re-elected unanimously, the secretary casting the ballot of the society as before. Mr. Wyman Elliot of Minneapolis was unanimously elected chairman of the executive committee. The following gentlemen were elected members of the executive committee: J. S. Harris, La Crescent; Prof. S. B, Green, St. Anthony Park; O. F. Brand, Faribault; L. H. Wilcox, Hastings.

Prof. Otto Lugger of St. Anthony Park was unanimously re-elected entomologist.

Mr. A. W. Latham of Excelsior was unanimously elected librarian.

Mr. A. W. Latham then submitted a report as superintendent of the Minnesota horticultural exhibit at the Columbian Exposition. (*See index*).

On motion of Mr. C. L. Smith the following resolutions in regard to the exhibit were adopted after considerable discussion.

WHEREAS, We, the members of the Minnesota State Horticultural Society in convention assembled, having examined the plans for exhibition tables and the use of assigned space as proposed and submitted by A. W. Latham, the superintendent of the horticultural exhibit of the state of Minnesota, and finding them admirably adapted to best display the horticultural exhibits of our state, and

WHEREAS, We have also examined the plans submitted by the Board of Management of the Horticultural Division of the Worlds' Fair at Chicago and consider them to be unsuited to making a satisfactory state exhibition, and

WHEREAS, The space laid out according to the plans of A.W. Latham, superintendent of our state horticultural exhibit was duly and regularly assigned to us through him by Mr. J. M. Samuels, superintendent in charge of the horticultural building, therefore

Resolved, That we heartily disapprove the proposed changes, and insist upon retaining the space allotted to us by Mr. Samuels.

President Underwood then called the attention of the society to a promise exacted of him at the last meeting of the society, held in Owatonna, to furnish a receipt for making an old-fashioned pumpkin pie. He remarked that with the assistance of Mrs. Underwood he would not only furnish the receipt but produce the genuine article itself, which he did, and for half an hour the society enjoyed an informal lunch, one and all being unanimous in the opinion that Mr. Underwood's receipt was an unusually good one.

President Underwood then called the meeting to order again and the following resolution was offered:

"Whereas, It has gone on record that it appears to be the sentiment of this society that robins are an enemy to the fruit growers, and whereas it also appears that the shot-gun policy is the best policy for protection,

Therefore, Resolved, that it is the sentiment of this society that birds of all kinds are the friends of horticulturists and should be fostered."

The resolution was amended by inserting the following words in the resolution: "all birds now protected by the laws of this state" and the following words, "that we recommend the protection of fruit by netting and scare-crows, etc."

Motion unanimously carried.

J. O. Barrett of Brown's Valley then submitted his paper on "Forestry at the World's Fair" (*see index*), which was followed by Mr. Joshua Allyn with his paper, "Vegetables at the World's Fair." (*See index.*)

At this point Mr. M. A. Thayer, president of the Wisconsin State Horticultural Society, tendered an invitation to the members of the society to attend the meetings of the Wisconsin society whenever possible, and also to call on him at his fruit farm at Sparta. He also thanked them for the courtesy with which he had been entertained while present, and offered to send to any member of the society his little pamphlet on growing berries.

President Underwood replied, stating that all the members of the society certainly felt under great obligations to Mr. Thayer for all he had done in behalf of the Minnesota State Horticultural Society, and expressing the hope that he would

always be present at the annual meetings, thanking him for the invitations he extended and assuring him that all would be glad to avail themselves of them, whenever practicable.

Mr. J. S. Harris then submitted his report as a delegate to the summer meeting of the Wisconsin State Horticultural Society. (*See index.*)

This was followed by the report of Mr. O. F. Brand of Faribault who attended the Ontario society's meeting during the summer. (*See index.*) The society then took a recess until 7:30 P. M.

EVENING SESSION, THURSDAY, JANUARY 12, 7:30 P. M.

The meeting was called to order at 7:30 P. M., by President Underwood.

Mr. J. B. Mitchell, of Cresco, Iowa, a delegate from the Iowa State Horticultural Society, submitted a paper entitled, "Apple Trees from Seed." (*See index.*) Mr. Mitchell said that he wished to correct the report of last year, which made him say that trees grown from seeds would come into bearing sooner than grafted trees.

The society then listened to the report of L. R. Moyer of Montevideo, a member of the committee on deciduous trees and shrubs. (*See index.*)

This was followed by a short discussion, after which Miss Sara M. Manning of Lake City read the following report of the committee on out door herbaceous plants by L. R. Moyer of Montevideo. (*See index.*) This was followed by a long discussion.

Mr. L. R. Moyer then read the following paper, "The Prairie Flora of Western Minnesota," which was received with applause. (*See index.*) Considerable discussion followed the reading of this paper. At this point Mr. O. F. Brand, chairman of the committee on life memberships, submitted a report recommending for election to life membership Mr. William Somerville, stating that he was one of the original twelve who organized the association.

The motion was seconded and unanimously carried by a rising vote.

The society then listened to Mr. E. Nagel while he read his paper on "Plants for Easter Flowering". (*See index.*) This paper was followed by an interesting discussion.

The time had nearly approached for adjournment when Mr. William Somerville of Viola asked permission of the president to make a few remarks, which was granted. Mr. Somerville then thanked the society for the favor they had shown him, in the following words:

"*Ladies and gentlemen:* I have a few words that I would like to say to you at this time, and I don't care about having that young man there with a pencil write them down. (Laughter.) I feel that I ought to make known to you that I appreciate the favor conferred upon me awhile ago in voting me to a life member of this society. I remember well when a few of us organized the horticultural society of the state of Minnesota, in Rochester, many years ago. My friend Harris here calls me his oldest son, but I think there is some improvement in the stock. (Applause and laughter.) I have been laboring, doing what I could in my humble way to try and encourage fruit growing in Minnesota, especially for the last few years, and I have been out on a mission for the third winter now. I have talked in forty-seven counties in the state of Minnesota. We have had large crowds to listen to us at every place to which we have gone, and I don't think there has been any ocassion upon which the matter of fruit growing has not been made almost the leading feature of the institute. (Applause.) I am not doing this for the money that is in it, I want you to understand. Were it not that I see over the state of Minnesota the situation of nine-tenths of the farmers, I would be seated at home near the stove this evening, but when I look around over the state and see the farmers, how they are situated and the manner in which they live, it rouses all the ambition I have, and I feel that for the good of themselves and their families and for the good of the community they live in, that they should feed their children and keep them at home. (Applause.) I want them to feed them better. They give them enough to eat, it is true. They have coffee and bread and pork, and bread, coffee and pork. (Laughter.) That is the food that many farmer's children get in the state of Minnesota. It is no wonder that the young men of this state are all trying to get to the cities. We must make our homes more attractive. We must give them better living and more privileges, so they can associate with their friends and have a social time together, if we are going to keep the young men of the state of Minnesota on the farms.

Well, I go round and try to tell them what to do, in the very best way that I can, and how to raise small fruits, how to take care of them, how to plant them and how to cultivate them in order to get the best results. They pay a great deal of attention to me, and I am happy to say that my friend Cook has said to me that I have been the cause of the selling of over a million strawberry plants in the last year, and that is a good many. (Applause.) I do not recommend any person in particular, but I tell them to go to worthy men to get their plants, to go where they can buy the cheapest, and above all, to buy of men who are responsible; but sometimes they get badly deceived in their plants. They get them from different places and from parties who are irresponsible. I have recommended them to different nurseries in the state, told them to send there, and they would be treated right.

I have also recommended the raising of apples, talked on that subject, and we have got them awake to the advantages of raising apples in Minnesota. I think before a great while that we will be raising almost a large enough supply for our own state, at least. I tell them that we can never overdo this business, that we have a portion of the state of Minnesota in which the prospect is not flattering that we will ever raise apples, and also in a great portion of the Dakotas. Hence we need not be afraid of setting out trees, although I never advise any farmer to set out any great quantity. We have not sifted this thing thoroughly yet. We have not had a test winter to know just what we can recommend and what we cannot, and for that reason we advise them to go slow, to set out a few and raise enough for their own family use, so that they can live better, at least, to that extent.

If there is a people on earth that deserve to have the best the earth can produce, it is the farmers on their farms. (Applause.) I did not expect to occupy but a minute when I got up here, and I think I had better stop right now. I want to thank you again, ladies and gentlemen, for the honor conferred upon me in making me a life member of this honorable society, promising you that I do not think I will ever bring a reproach upon the cause of horticulture. (Applause.)

Mr. J. S. Harris. It is a great satisfaction to a father to realize that he has a bright son. (Laughter.) A great many of the boys when they grow up into manhood think they are a great improvement on the old stock (laughter), but, nevertheless, the old man takes pride in them, in every smart boy of his. It does me good to realize that none of these smart sons of mine have ever brought any reproach on their parent. I hope the society will continue to flourish, not only while I am with you, but afterwards, as well, until there are a thousand of them as bright and smart as Mr. Somerville; and I hope they will enter upon the work just as he has done. Then Minnesota will not only grow apples for her own use, but she will grow such nice fruit that it will be known all over America, at least, and I should not be surprised to have the old beef eaters in England, and all over Europe, trying to get Minnesota apples. (Laughter and applause.)

Adjournment until Friday morning.

FOURTH DAY.

MORNING SESSION, FRIDAY, JANUARY 13TH, 1893.

After the meeting was called to order by President Underwood, at nine o'clock, Mr. J. S. Harris of La Crescent submitted his report on nomenclature. (*See index.*) Upon motion the report was adopted.

Mr. Joshua Allyn then submitted his report as a member of the committee on vegetables, and was followed by Mr. E. M. Chandler, another member of the same committee. (*See index.*) These papers were followed by a long and interesting discussion, at the close of which President Underwood read the following telegram to the society:

LINCOLN, NEB., January 13.

J. M. UNDERWOOD, *President State Horticultural Society:*

Cordial greetings. Palm leaf fans and linen dusters worn by our members, exclusively.

F. W. TAYLOR,
Secretary Neb. State Hort. Society.

Prof. H. Snyder submitted his paper on "Agricultural Chemstry." (*See index.*) It was received with applause and followed by considerable discussion.

This was followed by J. J. Baston's paper, entitled "Onion Culture," which, Mr. Baston being absent, was read by request of several members of the society by Secretary Latham, and followed by discussion. (*See index.*)

Prof. W. M. Hays of the North Dakota Agricultural College Fargo, N. D., then entertained the society with a paper entitled "Horticulture on New Prairie Farms," (*See index.*) The paper was listened to with interest, and was followed by a short discussion.

The next paper submitted was that of Mrs. Clara S. Hays, of Fargo, N. D., on "Fruits and Nutrition." (*See index.*)

Mr. Joshua Allyn of Red Wing followed with a paper, "My Failure in Growing Celery." (*See index.*) A discussion followed, in the course of which Mr. J. A. Sampson of Excelsior described his experiences in growing celery. (*See index.*)

The society then adjourned until Friday afternoon, January 13th.

AFTERNOON SESSION, FRIDAY, JANUARY 13.

The society was called to order by President Underwood, at two o'clock P. M.

Mr. Wyman Elliot of Minneapolis, addressed the convention as follows:

Ladies and gentlemen, At Lake City last summer the society awarded me nine dollars in premiums for some dahlias and some fruit that I carried down there. It was a surprise to me, and I made a resolution at that time that I would not retain that money, but that I would lay it out in books and donate them to this society. (Applause.) Consequently there are seven books here to-day that I have selected for the society, and

paid for with this money. I want to present these books to the Minnesota State Horticultural Society, and I hope you will receive them. (Applause.)

Mr. J. A. Sampson, Excelsior: I move a vote of thanks to Mr. Elliot for his kindness in presenting such valuable books to this society.

Dr. M. M. Frisselle, Excelsior: I rise to second that motion. I think that the society is under special obligation to our ex-president, Mr. Wyman Elliot, for this very generous gift. It certainly is very timely and very acceptable in many respects. I know I speak the sentiments of the society when I say that we all fully appreciate the gift, and accept the offering of Mr. Elliot with many thanks.

Mr. C. L. Smith, Minneapolis: I would like to second that motion, but it seems to me almost a burlesque to do it, because, after all, this is such a minute part of the great obligation the society rests under to Mr. Elliot. During the past twenty years, at least, the one man who has stood as the horticultural society of Minnesota has been Wyman Elliot. Of course, others have done what the could, and when they could, but the one man who has been ready to do what nobody else could do, and what everybody else did not do, the one man who has done anything and everything that the rest of the society could not do, has been Wyman Elliot (applause); and so while I heartily favor this testimonial, as I say, it seems almost a burlesque to thank a man for a little thing like that and lose sight of all the greater things that have been done by him. (Applause.)

Mr. J. S. Harris, La Crescent: In that donation we see a nucleus for our library. We have, in addition, our own reports and a few exchanges. Last year it was my privilege to bring up quite a bundle of books, and I did so this year also. Now, if every member will act as a kind of committee of one and gather books for us, when we get that new home we are expecting so soon, we shall have a library and reading room that will make it an interesting place for us old fellows—and the young fellows, too—to go into and finish our education. I heartily second the vote of thanks also. (Applause.)

The motion was unanimously carried by a rising vote.

Mr. J. S. Harris, then presented the photograph of Mr. Jonathan T. Grimes, a venerable member of the Minnesota State Horticultural Society, to the secretary with the remark that Mr. Grimes had done much for the good of the society in past years, and requested the secretary to preserve the same.

Mr. C. L. Smith, of Minneapolis then offered the following resolution:

Resolved, That the salaries of officers of this society for the ensuing year be as follows: President $25, secretary and librarian $600, treasurer $25, assistant librarian $15; and that the expenses of members of the executive committee be paid to the place of meeting.

It was moved and seconded that the resolution be adopted, and Messrs. Smith, Underwood, Wilcox, Barrett, Pendergast, Stevens, Harris and others, spoke heartily in favor of the secretary's services during the past year, and expressed the hope that the resolution would be passed. It was adopted by a unanimous vote.

Secretary A. W. Latham: "I wish to say a word upon this matter, it being one in which I am somewhat interested. Of course, I feel very grateful to you for the evident appreciation that you show of my efforts to do well the duties of the office of secretary. It always affords me pleasure to do well the things that I do, and in taking up the work of the secretary where our good brother left it off, I felt that from that time on the interests of the society were to some degree in my hands, and that upon the efforts I should make would depend somewhat the success of the association. I have only this to say: I have simply tried to do my duty.

Last year the executive committee recommended that the reporter be paid from the funds of the association instead of having the secretary pay him out of his salary, and that was a proper thing to do; that resulted in increasing my salary. As to the appropriation you have made for this purpose this year—I do not receive it as in any sense a pledge as to any particular thing that I am expected to do in the future. I do not wish to receive it in that way. I wish to receive it for the manner in which I am performing the duties of the secretary's office, and as far as any work that comes up is concerned that can advance the interests of our society, be it now or later, I intend to do it as far as it lies in my power, whether the salary is adequate or not. While I continue to hold the office, I feel I am sure of the appreciation of the ladies and gentlemen who compose this society. (Applause.)

Mr. Gilbert Chandler, of Minneapolis, then introduced the following resolution:

Resolved, That the Minnesota State Horticultural Society favors reducing the legal weight of a bushel of onions from fifty-seven pounds to fifty-two pounds.

The resolution was seconded and adopted unanimously.

Mr. O. F. Brand of Faribault then read the report of the fruit committee.

After some discussion and change it was adopted. *(See index.)*

Mr. J. S. Harris of La Crescent then offered the following resolution:

Resolved, That all varieties of native plums, where possible, should be grown on their own roots, and not grafted.

Resolution was adopted.

Mr. J. A. Sampson, of Excelsior, then submitted the following resolution:

WHEREAS, Much fruit has been badly damaged and nearly spoiled by careless handling of railroad and express companies, and

WHEREAS, It is to the interest of railroad and express companies to encourage the growing of fruits, that they may have the handling of the same, and also hasten the development of the country along their line, therefore be it

Resolved, That we, the horticulturists of the state of Minnesota in convention assembled, request the several railroads and express companies to cause special care to be taken of the fruits shipped over their lines.

Resolution seconded and unanimously adopted.

Mr. J. S. Harris of La Crescent submitted his report on entomology, and it was accepted and filed for publication. (*See index.*)

Miss Sara M. Manning of Lake City then read a very interesting report written by Mrs. G. F. Benson of Lake City, a member of the committee on ornithology. (*See index.*)

Col. J. H. Stevens then moved a vote of thanks to the ladies and gentlemen who had read papers before the society, including those not members.

The motion was seconded and unanimously carried.

Mr. C. L. Smith, of Minneapolis, then described to the society his method of constructing and using a glass box for protecting growing vines. (*See index.*)

Mrs. Jennie Stager of Sauk Rapids offered the following resolution:

Resolved, That the ladies of the State Horticultural Society heartily thank the officers of this society for their kindness and hospitality in entertaining them.

Motion seconded and unanimously carried by a rising vote of the ladies present. President Underwood remarked that the society felt themselves under obligations to the ladies who had favored them with their presence and participated in the deliberations, ending with the hope that their numbers might be largely increased the next year.

Mr. L. R. Moyer of Montevideo then submitted the following resolution:

Resolved, That we learn with great regret that the railroad companies of this state are so short-sighted and unmindful of their own true interests as not to grant the usual convention rates to this society.

Resolved, That there be a committee of three appointed to wait on the railway managers, and convey them the sense of injustice that is felt by this society.

Mr. Hays moved that the resolution be adopted and that the president appoint a committee of three to act in the matter.

Motion was carried, and President Underwood announced that he would defer the appointment of a committee until later.

Mr. J. S. Harris moved a vote of thanks to Senator C. K. Davis and Congressman Lind and also to the general government for the appointment of a special agent of pomology for Minnesota. Motion seconded and carried.

Mr. Wyman Elliot moved that any member of the association who wished to attend neighboring horticultural meetings as delegates at their own expense be invited to do so.

Motion seconded and carried.

Mr. J. S. Harris announced that he intended to attend the meeting of the Wisconsin State Horticultural Society.

The society then adjourned to meet in the evening at Villa Rosa.

Evening Session, Friday, January, 13th, 1893, Villa Rosa, Minneapolis.

In accordance with the invitation extended by Mr. and Mrs. Dorilus Morrison, the society convened at their residence, Villa Rosa, Friday evening, January 13th, at 7:30 p. m. About seventy-five members attended, accompanied in many cases by their wives, daughters or friends, making the whole number present in the neighborhood of one hundred. The residence had been prepared for the meeting in an appropriate way, by decorations characteristic of the interests in which the society is engaged, the flowers and fruit pieces arranged about the rooms forming a beautiful sight. A program had been prepared, consisting of addresses of welcome and responses to toasts from members of the society and invited guests, and it was pleasantly carried out as follows:

Words of welcome by Prof. W. W. Folwell of the State University: I suppose it may be a matter of wonder to some of you, why one not of this house should stand up here to make a so-called address of welcome, but that is easily understood. It is not exactly a household matter, it is a kind of Minneapolis matter. So it is a perfectly natural thing that one of the neighbors, who wanted to make himself useful, should be called in to perform this service. (Applause.) I am very happy on behalf of this household and the city of Minneapolis to welcome this society to the city

of Minneapolis and to this representative home of the city of Minneapolis. (Applause.) There are the best reasons why we should do this, for if we can honor you we certainly honor ourselves.

It is a matter of history what this body of men has done already for the state of Minnesota. My recollection goes back some years to the time when most of you were younger than you are now, when you were beginning the enterprise that was thought to be quite vain. The idea of raising fruit in Minnesota for market! Why, when I came to this state twenty years ago it was regarded as quite an impossible thing. You have changed all that, and Minnesota fruit is now a marketable product in large quantities and of excellent quality. I felt very proud indeed when I read several years ago, that at a meeting of the American Pomological Society in Philadelphia the best apple that was shown was a Minnesota apple. (Applause.) That was the work of this society. So, for what you have done, for your record in the past, for your promise of the future, for what you are to-day to this state and the great Northwest, we are very proud and happy, indeed, to welcome you here.

There is a very good reason why you should be here at Villa Rosa, where the queen of flowers has a palace and a home, or, to change the figure, I might say where the queen of flowers has a throne to which pilgrims from far and near resort in a happy time when the roses bloom. Some of you, I have no doubt, have been at the rose fetes held at Villa Rosa and know something of the gladness of those happy days.

Although it is merely flowers that blossom around this mansion, if you will look to the right of them you will see a good old-fashioned vegetable garden, which would do your heart good to see. The spinach, beet, radish and turnip all flourish here. Far beyond the old barn lies a meadow, and if you should ride along by there in the right time of year, you would see the flocks of Southdowns disporting themselves in that meadow. I am glad to see them when I ride by; I am glad to see any barrier set up against the advancing stream of city improvements. I suppose it is necessary to some extent, but I am glad when I see anything that tends to check and stem the tide of the advance of city improvements.

Now that I am welcoming you here I do not mean to do this thing by halves in any way. I was not asked to do this thing by halves. (Applause.) So, I say come in here, hang up your hats and make yourselves at home, ladies and gentlemen, and ramble all over this old-fashioned house which has stood here in its respectability until the fashion has come around again, and it is now at the top of fashion. Do not fail to look at the picture of a splendid lady in the old parlor there, a fine work of art, which, as my friend, Dan French, the sculptor said, is alone worth the price of admission. (Laughter.) Make yourselves at home and help yourselves to all you see, and if there is anything which you want and do not see, just ask for it. (Applause.)

President J. M. Underwood: I will ask the oldest member of the State Horticultural Society to respond to the cordial welcome that has been given us.

Mr. J. S. Harris of La Crescent then stepped forward and after the applause which greeted him had subsided, made the following remarks.

Ladies and gentlemen: In behalf of the Minnesota State Horticultural Society I extend to our host and hostess and to the city of Minneapolis the hearty thanks of this society for the cordial welcome which we have received at your hands. I do it because we all feel that you realize the great work this society is engaged in. You realize that the horticultural society is an institution worthy of its name. We are always glad to hold our meetings in the city of Minneapolis.

Years ago when it was told abroad that fruit could not be grown in Minnesota, that it was only a good place to take up claims and sell them to some greenhorn who would come in, when it was said that you could not raise anything here but potatoes and squashes and turnips, a few of us said that if fruit could not be raised here it was not a place for civilized men to inhabit. We came and looked the field over and made up our minds that the great Creator never made such a beautiful country as this to be a land unfit for the habitation of the noblest men upon the face of the earth. We said, we will grow fruit here.

Twenty-six years ago last October, we held our first meeting in the little city of Rochester. That was at the time of our state fair. These old veterans had been toiling on for ten or fifteen years with varying success in raising small fruits; there never had been an apple grown here so far as history tells us. A dozen of us came together and talked the matter over, and there was born a little child, not exactly in a manger, but in the wilderness of Minnesota. It was a weak child, and if it had not been very well nursed at times by this noble city of Minneapolis, I do not know but what it would have starved to death.

A year passed on and we came together again, and there were just twelve of us, as before. Some of the old twelve had backed out, but there were enough recruits so that we had twelve at our second meeting. And, then, at Minneapolis, that noble man, Col. Stevens, and his friend, Wyman Elliot, saw that we were in earnest and that the baby was bound to live, and they gave us something to nurse it with, and gave us substantial encouragement.

Well, now we have grown up and feel that we are as a strong man, almost a giant. Where we only had eighteen varieties twenty years ago on exhibition, to-day we have exhibitions in the state that call out varieties by the hundred.

We feel grateful to Minneapolis for the many times they showed us great kindness when we were little fellows and the big fellows were liable to crush us out or trample on us. We number now probably four hundred strong, and we are strong in the belief that the day is at hand when Minnesota will be noted not only within her own borders, but all over the United States of America, as being a good apple state, and a state in which all the hardy fruits of the temperate zone will grow to greater perfection and beauty and finer quality than in any other state in the country. (Applause.) And perhaps even some of our European neighbors will one of these days be calling for some Minnesota apples for their own use.

We are trying to fulfill other missions besides growing apples. It is a part of our mission to teach people to beautify their homes and surround them with evergreens and deciduous shrubs and trees.

Now, do not call me egotistical because I say that I believe we are doing something of great value to this community. It is natural for an old man—and they say I am the father of the society—to feel proud of the work of his children. We thank you again for the kind welcome you have extended to us, and we promise you that we will go home from this place remembering you at all times, and that we will have something to tell our children and grandchildren about this successful meeting that we have had and this reception you have given us to-night. (Applause.)

President Underwood: Referring to infants and children, as brother Harris has done, I will ask Professor Charles M. Jordan to respond to "Horticulture in the Public Schools."

Prof. C. M. JORDAN, Supt. Minneapolis Schools.

Mr. President, ladies and gentlemen: I know something about horticulture, and perhaps a little about public schools, but how to mix them is a problem which I cannot solve. I am somewhat like the man who wrote the history of Ireland. He incorporated in the history all that he could think of and all that he could learn about it, and, finally, he concluded that he would write a chapter on snakes, so he headed the last chapter, "Snakes in Ireland." After investigating a few days and finding out the true state of affairs in that country, he simply wrote as his last chapter "There are no snakes in Ireland." (Laughter.) I might say, "There is no horticulture in the public schools," and the only reasons for it is because we have never thought of it. If there is anything else except horticulture that is not taught in the public schools, I do not know what it is. (Laughter.) There is, perhaps, a reason which I think of to-night why it ought to be taught. If we teach the girls how to cook the cabbages, we certainly ought to teach the boys how to raise them.

We have done one thing, however, in the schools of this city in the direction mentioned here to-night, and that is in the beautifying of the school grounds of the city. The sand-heaps of a few years ago have disappeared, and to-day we have in very many parts of the city very beautiful grounds and nicely kept lawns, sprinkled with flower beds and dotted with shade trees. We celebrate the planting of trees every Arbor Day. The park board furnishes each school a tree; we plant it with a great deal of ceremony, we recite poems, we sing songs, we watch and water and tend the tree for three or four months, and see it die. (Laughter.)

But there is one thing that we do try to teach in the public schools every day, and that is the dignity of good, honest, manual labor. We try to teach the boys that it is just as honorable to handle the hoe as it is to handle the scalpel, and that the man who stands under his own vine and fig tree and looks upon the good work of his own hands is as much entitled to credit as the man who stands in the pulpit and preaches a poor sermon. (Applause). We try to show that the boy who split rails and the boy who followed the tow path have risen to a place in this country in the affections and respect of their countrymen, such as is very rarely reached by the boy who has been brought up in the lap of luxury and who has never known a want that has not been satisfied.

I was reading a few days ago in the life of Thomas Jefferson, that one day when he felt that he was not appreciated he sat down and made a list of the things he had done which seemed to him to be valuable to his country. He noted among other things the establishment of a church;

his attempts towards the abolition of slavery, or the importation of slavery that he had written the declaration of independence; and side by side with that, as if entitled to equal credit and equal honor, he mentioned the fact that he had introduced two plants into the American nation, and he said that the man who introduced a new plant for cultivation did the greatest service to his country. And, as this seems to be Jefferson's time, and as he has come to be the prophet of our country again, we cannot do better than to close with his words, "The cultivators of the earth are its most valuable citizens; they are the most independent, the most vigorous, and the most virtuous; they are tied to their country, and bound to its interest by the most lasting bonds of union." (Applause.)

President Underwood: Recognizing the importance of the papers of our city and state, and of all cities and states, in advancing the interests of horticulture, I propose the toast "The Press and Horticulture," and ask Mr. C. L. Smith of the Minneapolis Farmers' Tribune to respond.

C. L. Smith: *Ladies and gentlemen:*—During the twenty-six years which have elapsed since the birth of that infant friend Harris has told you about, a ceremony at which I officiated as one of the historical twelve, there has been a great growth and a change in public opinion regarding the cultivation of fruits and flowers in our beautiful state. At that time the only flowers cultivated were of the commonest, crudest sort and the fruits, as you have been told, were few and far between. The general public was sceptical and unbelieving, and scoffers were numerous, and those who were willing to even experiment in the matter of growing fruits and flowers in Minnesota were few. Roses did not bloom in the gardens of our state then, and if there had been a rose fete held in Minnesota it would have been necessary to send to Chicago or New York for their roses. The few berries that we had were the wild ones that grew on the banks of our streams, and the apples came only at long intervals up the river on the Mississippi steamboats.

Now, of course, the ladies and gentlemen who were largely instrumental in bringing about the present state of affairs did so because of their love for the work and the pride they took in their beautiful flowers and fruit; but they also took a great deal of pride and satisfaction in the accounts published in the newspapers of what they had done, and in many cases they procured numerous copies and sent to their friends in the East, to show them what they were doing in Minnesota.

The press has not only been an educator, but it has been a stimulant in this work of horticulture in the Northwest. In this nineteenth century, when a man or woman has worked out some problem in agriculture or horticulture or in any other branch of human industry, some enterprising newspaper man interviews him and investigates to the very last detail of that work, and this thing that has cost him so much time and toil and thought becomes public property and is spread out for the use of the whole world.

There was a time when the press of the land might speak of the beautiful tree on which the pumpkins grew and other equally absurd things (applause and laughter), but to-day the man or the woman whose production of pen or pencil finds its way into the public press, must write intel-

ligently of the things he treats of, if he would have his article accepted by the press. (Applause.) If he writes of roses, he must know how roses are grown, and when he writes out those details he must be one who knows that those details are practical and sensible; because newspapers have learned that their constituency are not willing to pay for anybody's theories. They want facts. (Applause.) And so the press of the whole country to-day, in treating of agriculture and horticulture, treat of facts; and, because of this, the public press has become a powerful adjunct to horticulture.

Just one illustration, and then I am done. Two years ago, in our farmers institute work Prof. Gregg introduced to the institute a plan of a farm, and told of a man who had produced a thousand of pounds of grapes that year in a way peculiar to himself—a thinking and reading man, who had belonged to the horticultural society and had followed all that brothers Harris and Latham and these other horticulturists had written on the subject of grape growing, and then applied them as far as he could practically to his surroundings and his soil and his facilities for doing the work. He had done it well, and he had been successful. He was traveling the right road. He stood, then, on that platform and he told those farmers how one farmer had planted and grown grapes successfully. Now, a newspaper man sitting in the audience listened to all this and wrote down the details. Then Mr. Gregg sketched roughly a plan showing the pruning of those vines. Well, in the city of Minneapolis an artist transferred that picture to plates, and a few days afterwards those notes —the details of that man's work in his garden with those grapes—were published with the illustrations and delivered to the citizens of the entire Northwest. It was plain and practical, and it shows the advance in the management of the press of the world. That plain, practical talk was given to the farmers of America, to the farmers of Europe, and even to those of Australia in less than sixty days (applause); and so this work goes on.

A man develops a new fruit or a new berry; a man develops a new method for caring for his fruits during our severe winters; some enterprising newspaper man gathers up the details, spreads them before the general public, and that little secret becomes the property of the whole country. My friends, it may be unjust, but it is certainly in the interests of humanity. I believe that the individual who takes the thought and dresses it up in the garb that is most attractive and accessible to the general public becomes the owner of that thought and receives the honor of it. This much the press gets, perhaps, that does not belong to it. (Laughter.)

President Underwood: Emphasizing still further this thought of education, I propose "Education and Horticulture." It lifts the old out of the ruts and makes smooth the path for the young. I call for Prof. S. B. Green to respond.

Prof. Green: This is a subject in which I am deeply interested, and it is one I have quite a good deal to say on, but our chairman told me I could have but five minutes to talk upon it, so I thought I would jot down some notes to aid me, as I was

afraid I could not say all I wanted to on the subject, otherwise, and leave any time for anybody else to speak. (Laughter.) *(Reads paper, which the secretary cannot get hold of to print.)*

President Underwood: If there is any feature of the Minnesota State Horticultural Society of which I am proud, it is that feature which gives to us such valuable allies in our women representatives, and I propose "The Horticultural Garden," and call upon Mrs. A. A. Kennedy of Hutchinson to respond.

THE GARDEN FOR WOMAN.

MRS. A. A. KENNEDY, HUTCHINSON.

Any one might infer by the number of times I have been requested to write upon the subject of gardening, that I was born and brought up in a garden; but this is not so. If it was I might, perhaps, have been more successful. My father was a "down easter," a "Yankee" if you please, and any one that has push and energy enough to make a good living at farming among the rocks and mountains of New Hampshire, is capable of taking care of a garden in the West without the help of a woman. Of course, I knew that the garden was the place where they raised vegetables, but that was about the extent of my knowledge in that direction. But I have long since learned to love this avocation. It is a splendid rendezvous to which a woman may hie when vexed with petty household cares and pour her sorrows into the imaginary ears of her beloved plants. It is so much better than whispering them to a gossiping neighbor. They *never* betray our confidence, and then they listen with such respect, too.

When the Great I Am had created the world and placed the sun, moon and stars in their proper places, even before he had brought man, the lord of creation, into existence; (and, by the way, I am afraid, if they *will persist* in placing the *ballot* into the hands of *women*, they will lose their identity as far as their appellation of "lord" is concerned) He proceeded to lay out a garden, thus sanctifying the calling and making the *garden* a proper place for woman. And here she can find ample scope to expend all her strength, knowledge and wit. I often wonder what that Garden of Eden must have been like. Of course, it must have been perfection itself, perfect in all its appointments. And so I find myself wondering, as I walk among my own vines and plants, admiring the abundance of fruit and their lovely bloom, what *that* must have been with its fruits and flowers, and, as the queen of the floral kingdom is the rose, it must have grown there in great profusion, thus filling the air with the sweetest perfume. Thus our surroundings here amid the abundance of this queen of flowers, with its delightful fragrance, at least suggests, and in a large measure restores, the *Eden* we have lost.

President Underwood: I will ask Miss Smith to recite a poem which I think will impress the members of the society as being especially appropriate upon this occasion.

Miss Dixie Smith, a daughter Mr. C. L. Smith, editor of the Farmers' Tribune, then recited a graceful and beautiful little poem entitled "The Birth of the Rose", receiving well-deserved applause.

President Underwood: Whom shall we call its champion? "The Rose, the Queen of Flowers." I ask that Mrs. Morrison respond.

The hostess of the evening, Mrs. Dorilus Morrison, then stepped forward and after the applause which greeted her had subsided, read the following very interesting paper.

"THE ROSE—THE QUEEN OF FLOWERS".

MRS. DORILUS MORRISON, Villa Rosa, Minneapolis.

Mr. President, members of the Horticultural Society and friends:

It is a long step from the amateur to the expert, and I have not yet bridged that chasm, as you will quickly perceive.

Nevertheless, I am pleased to see some among you here who are not unacquainted with my zealous devotion to the rose, and, possibly, the surest evidence of that interest to all who pass our portals, is the inscription "Villa Rosa," which stands as the insignia of our home.

In the invitation of long standing, extended by this honorable society through your secretary, Mr. Latham, requesting that I speak before you upon "The culture of the rose in private grounds," I have ever been mindful of the high compliment paid me, but our absence from home at the time of your sessions has prevented acceptance, and a natural reluctance to speak as an amateur before professionals has not hastened the overcoming of hindrance which stood between your kind invitation and my earlier response.

But, while it is quite true that in studying the history of horticulture in the United States, covering a period of the last thirty years, we find it has rapidly advanced, and that its progress is largely due to the horticultural societies, especially those of Massachusetts and Pennsylvania, I am fast growing into the belief that more value for the promotion and success of *town* rose gardens, at least, may follow the experiences and discriminations of an amateur, than where the pursuit is adopted as a business, which is not often conducive to enthusiasm.

In this delightful pastime and recreative pursuit an amateur finds much time to *talk* about roses, to *experiment* with them, to *read* about them; and what a special literature has sprung up pertaining to horticulture and floriculture! Not only have the leading agricultural journals a horticultural department with a competent editor, but special periodicals, like the French Journal "Des Roses," which is given over exclusively to the consideration of th's regal flower, are now delightful avenues to more practical acquaintance with *the first lady* in Flora's court.

It comes to me that any message I am privileged to bring to you this evening should be mainly through the door of my own experience, and though that history covers much of defeat and something of success, and will be unattended with anything especially new or startling to advance to you who are so much wiser than I, it is a genuine pleasure to open

our garden gate and pass through with you to bud and blossom, whose unfolding and developement have constituted at once my study and my delight.

As we pass down the garden paths, we discover that I was fortunate in finding here ten years ago sheltering hedges and attractive borders of fragant roses, with good staying qualities; they had been planted here by loving hands and nurtured into vigor by thoughtful intelligence. To this day, with all the experiments that I have since tried, I confess to a very great fondness for that same old Provence rose, which I so well remember in my father's garden, and which was the first rose grown here to any extent, because of its hardiness, and the impression which I am told prevailed in early days that no other could well survive the extreme frost and cold of this rigorous climate.

There is little need to call the attention of your experienced eye to the special advantage of the *soil* of our garden for successful rose growing. Just here upon this ridge of our city's ground, it so happens that this prime condition is more favorable than almost any other in the town, because of its natural clay soil, so vitally essential to the success of the rosarium; sandy food, we know, starves and kills even unwearied effort in the life and glory of the rose. Jack frost, too, deserves my appreciative thanks, that he forgets to put on his chilly coat until he has paid his compliments nearly a week earlier far down in the heart of the city.

As we wander about the garden, you will remark the absolute perfection of natural drainage here, and if we look about on all sides it is observable that the absence of smoke and dust and railway traffic, in which unfavorable atmosphere the brave rose droops and fades, is another condition to be congratulated upon.

But I greatly fear if I enumerate and call your attention to many more natural advantages of our rose garden, as I found it, that you will fail to credit me with little else than buying roses at haphazard and planting them *anywhere*,—and I have to confess to a good deal of original sin in this direction.

It became early my pleasure and object to extend and increase the *varieties* of our garden, an undertaking prolific with difficulties at the very outset. But in roses, as with all things else in life, I reasoned it to be wise to set the mark *high*..

My imagination had long been stimulated with Pliny's account of the rose gardens of the Romans; I was charmed and interested in the history of Charlemagne's policy in the establishment of rose gardens by royal edict; and the beautiful rosariums, founded by Cosmo de Medici, stirred quick response in my ambitious heart. True, their floral pageant filled its lungs with the mild atmosphere of sunny Italy, but in and about Savannah and Charleston and the bright, warm portions of our own attractive clime, I came upon such bewildering roses in our travels there, that Mr. Nagel will remember the first large lot I selected and induced my husband to send up to Villa Rosa from Savannah, and the beautiful snowy creeper La Marque, with its roots torn out of the soil of Charleston to grace our arches and floral bowers.

No babe in swaddling clothes was ever handled more lovingly, and I think I can safely add, more ignorantly, than the attentions I showered upon those southern belles in the first years of my experiment with this noble flower.

The faces of our Savannah roses were like camelias in perfection, and though without fragrance, every bud fulfiled its promise of cream-white or rose-pink or variegated petals, in a way that brought delight to all who saw or plucked them. But I had not yet learned the science of grafting on the manetti, and though this lot of roses grew well for two or three years it gradually came about, in the hurry of our too short season, with too many things to do at once, that the wild rose from the root was suffered to outgrow the graft for want of frequent pruning, until, lo! I was astonished one summer day with a forest of bushes and an utter rout of the blossoms which had so charmed me.

Thus, when ignorance and neglect are harnessed together in the care of the rose garden, it is not difficult to opine where and how the mischief may end.

But wisdom, not unfrequently, is born of disaster, and, happy to relate, from the huge heart-shaped mound where those southern beauties outgrew their normal stature, there now flourishes promising thrifty plants of hybrid perpetuals and hybrid teas, while just across the garden path from a large star shaped bank the ever faithful General Jacqueminot nods and reddens and glorifies its abiding place.

In the multiplicity of crosses made between different groups of roses and the variety and classes thereby engendered, my favorite of the garden has always been the crested moss rose, with its exquisite buds, embroidered with curly green without, and the sweet fragrant heart of perfect rose petals within. Though they require the highest culture and richest soil, they are suggestive of a refinement in form and color, which betokens the thoroughbred. Every bud fulfills its promise of the full wide-open flower and this reminds me of the deplorable fashion which obtains of late, of florists cutting the roses for market before the bud has any hope of arriving at the flower. In the rose fetes given at Villa Rosa these two last years, I have experienced the greatest difficulty in procuring real roses in abundance, rather than the starved, pinched, immature buds, which never from the first were expected to show their eyes or even lift up their faces. Let us have some old-time *roses*, my friends. There is much in the prophecy of a bud, but there is a vast deal more in the splendor of the full bloom.

Though every rose garden of fair dimensions is improved by the instal lation of a good professional gardener, and I owe much to our own excellent German head gardener who has been with us these many years, it cannot be too strongly urged that every lady of this fair city, and other cities, having space, leisure and means, make floriculture something of a study, until the month of June in Minneapolis should develop into a very *carnival of roses*.

While Boston excels in the exhibit of hybrid or remontant blooms; while New York is the first in the showing of fine hybrid teas, and New Jersey brings her roses under glass to the greatest perfection, it remains for Minnesota,—does it not?—to ask herself the question, what *place* she is content to occupy in the horticultural scale, representing the combined forty-four of our great United States.

Have we yet a horticultural hall with library and offices attached, as a magnet to draw together from different portions of the state all those engaged in this interesting pursuit? While in Boston last week, I was

greatly interested in my visit to their horticultural hall, a spacious, attractive building, containing two large halls for their flower festivals. The walls were adorned with twelve fine portraits of horticultural presidents, beginning with Gen. Dearborn, who was the first to occupy the honorable position of president of the Massachusetts horticultural society, established in 1829. It is their glory that this society has a *library* connected with her hall which ranks as one of the foremost five of the world, while its collection of purely horticultural works is by far the finest in existence.

Among the most valuable in this superb collection is the "Flora Graeca" of Dr. John Sibthorp, a gorgeous work and by far the most costly in the library, the expense of its production being no less than one hundred and fifty thousand dollars, and, as only thirty copies were sold, each cost the estate of Dr. Sibthrop five thousand dollars. I passed a morning of rare delight in looking over this magnificent work, in ten volumes, containing one thousand figures of the plants of the Grecian peninsula and islands, in their natural size and color.

If the "Flora Graeca" was the most expensive to produce, perhaps the "Flora Danica" is the most remarkable; nor is it possible to imagine any person so indifferent to botany or so uninterested in plants and flowers, that they can look through the eighteen large volumes of this sumptuous work, containing portraits of the plants which grow in the kingdoms of Denmark, Norway and Sweden, without being lost in wonder and delight. This rare work which graces the shelves of the Boston horticultural library is a noble example of scientific zeal, having been completed in 1883, one hundred and twenty-two years from its beginning, and costing the highest thought and research of four generations to pursue and complete the marvelous production.

While wandering about among these attractive works of the Eastern library, I was constantly asking myself what Minnesota could do for the larger developement of her horticultural resources, and what limit of time she would require to put in the foundation stones and rear a creditable edifice of her own wherein to gather luscious fruits and display floral triumphs indigenous to her fertile soil.

Though it was not possible to satisfactorily answer this question of my own asking, it brought back to me an attractive plan which has for a long time animated me with pardonable pride, as I contemplated the possibilities of this fair city and state of the West, so inviting in summer climate, so rich in unfeigned hospitality, so resistless in enterprise, so liberal and quick to respond to the upbuilding of all that is worthy to endure.

To the horticultural society of the state of Minnesota, represented here to-night, I submit and suggest the desirability of a bold pioneer spirit in the domain of floriculture.

If it be in order for one so recently becoming a member of your honorable society as I, to introduce a resolution to-night, I move that this society, in emulation of the instructive and charming national rose shows held in the Crystal Palace, England, and in St. James Hall and the horticultural gardens in London, for these thirty years past, which have contributed so largely to the education and delight of the masses of the people, do consider and decide to hold a national rose show in the city of Minneapolis at whatever place and on whatever date they may hereafter

decide, and that to the greater furtherance of this picture of beauty we courteously invite the horticultural societies of every state in the union to send us their bravest and best roses of every form, variety and color to successfully compete for honorable prizes given by this society. Our beginning may be modest enough, but it will be quickly taken up by sister states, and thus Minnesota would stand first in line and claim the honor of organizing and instituting the first national rose show of America. For the greater success of that notable event, let me offer the first prize of a silver cup, garlanded and engraved with roses, to be given to the most successful grower of my favorite of the garden—the crested moss rose!

And I warn you, gentlemen, that the gardens of Villa Rosa may be a competitor for that very cup.

At the conclusion of Mrs. Morrison's paper, Mr. J. S. Harris stepped forward and responded as follows:

Mr Harris: Allow me to extend the thanks of the Minnesota State Horticultural Society to you for the kind and cheering words we have heard from your lips to-night. (Applause.) You have touched upon a scene which comes home to us all this evening, and we expect and hope to see that bud open and the Minnesota State Horticultural Society have a home worthy of the horticulture of this great central Northwest. I hope that the seed is sown, that the plant has sprouted, that the bud is here to-night and that it is opening, and that very soon we will have that hall which will hold our library and the portraits of those venerable men who have spent the best part of their lives here on the prairies, in the ravines and barren places of Minnesota, trying to develop her horticulture. May God hasten the the time when that day shall come, and then, my brothers and friends, your servant can depart in peace. (Applause.)

Mr. C. L. Smith: I move that the Minnesota State Horticultural Society adopt the resolution offered by this new and exceedingly active member of our organization, by a rising vote.

The motion was unanimously carried.

Mr. Smith then pledged the earnest efforts of the members of the society to make the proposed national rose fete a success.

President Underwood followed, with a short talk upon the same subject, suggesting that a committee be appointed, or that it be referred to the executive committee; and Mr. Smith moved that it be referred to the executive commiitee.

Secretary Latham suggested that the executive committee was a rather large body to handle such a matter, but thought perhaps it might be left with the committee, with the authority to appoint a committee of three to see in what way it was possible for the society to carry out the suggestion. Mr. Smith

accepted the amendment, and President Underwood suggested that he wanted to have Mrs. Morrison made the chairman of that committee. The motion was carried unanimously, Mr. Harris remarking that the society wanted a committee composed of such people as Mrs. Morrison, and assuring Mrs Morrison that the executive committee would pledge itself to work with her in every way possible.

President Underwood: I feel in duty bound to express to Mrs. Morrison the pleasure that it gives me when she says that the Massachusetts society has a home, and that it is her desire to see the Minnesota State Horticultural Society have a home. It would almost seem as if she and I had been in consultation about this matter, but I assure you I have never had a word with her upon this subject. As some of the members know, it has been my desire for several years that we have a home. We have succeeded in starting a movement now in our society looking to that end, and we should be very glad to look to Mrs. Morrison for her encouragment.

I now propose "Flowers," and ask President Northrop to respond.

President Northrop. *Mr President, ladies and gentlemen:*—I am accustomed to speak with a great deal of freedom on some subjects, but when you see me with a manuscript it is because I know nothing about the matter, and therefore wrote it down. (Laughter.) Coming, as I do, after the last address, I think it is fitting for me to say it is eminently proper that our honored hostess should discourse to us upon the subject of the rose—the queen of flowers—beautiful in itself and in what it represents, for, as the poet has somewhere said—I don't know who he was nor where he said it, but there is such a poet:—(laughter)

"In every flower that blooms around
Some special emblem may we trace;
Young love is in the myrtle found,
And memory in the pansy's grace,
Peace in the olive branch we see,
Hope in the half closed iris glows,
In the bright laurel victory,
And lovely woman in the rose."

Flowers are God's most noticeable protest against materialism. Squashes are good, if properly cooked, but there is something material about them (laughter), especially after they are inside of you. (Laughter.) Beets are good, and so are various other garden vegetables of which I had a traditional knowledge when I was a boy from hoeing them in the garden, and of which I have a more scientific knowledge of late, from eating them out here. They are valuable but they are material. Is there anything material about the rose? A rose simply appeals to our

æsthetic taste, to our sense of beauty and sweetness, and I am often glad that God has put into the world such a richness of flower to make us see that there is something worth having besides what we eat and what we wear and what we put over our heads. (Applause.)

Take the cars and ride down towards the south of Minnesota, and see the fields pink with beauty; go even in the cars through that most desolate and uninviting and miserable country, it seems to me, that I have ever seen—from here to the "Soo"—and see the everlasting expanse of pink flowers all the way. It is beautiful! It does not feed anybody, except those who are very æsthetic, but it does feed them, and it appeals to all that is best in their nature.

I have never in my life seen such glory as resulted from the roses growing upon the least attractive kinds of houses, as in that valley in which Wordsworth lived and loved and appreciated all the things that were beautiful in nature. The traveler who comes down that valley looks upon a view that we cannot find in this country, because this country is so large we have not yet had time to cultivate it down to so fine a point; but the time is coming when this great continent of ours will be as thickly settled, and that same closeness of culture will be necessary. The time is coming when the traveler as he goes through this continent of ours, not merely upon the great lines of our railroads, but by the side roads we so often travel, will see the flowers blossoming at every porch and over every window where the outside culture is possible, and where it is not you will find the roses blossoming in all the windows on the inside, and will meet the sweetness and fragrance of the flowers within. And, as showing how much there is in flowers, what one of you traveling anywhere in a strange part of the country would feel afraid, even in the most wild and desolate part of the country, to enter a house where flowers are loved and cultured and appreciated, and where they are blossoming in their beauty and sweetness, and who of us would be willing to be barbarian enough to have a house and live in it year after year and never have the voice of the flowers heard within it? (Applause.)

President Underwood: I will ask Prof. Pendergast to respond to "The Rose as a Teacher."

Prof. W. W. Pendergast: There has been a mistake made here, in fact, there have been several of them. Yesterday I was given my subject, and when I came here this evening I found it had been assigned to somebody else. President Northrup has made my speech, and I will submit to you it has been a very good one, and I want to have the credit of it. (Laughter.)

President Northrop: I was over to your place yesterday and got it. (Laughter.)

Professor Pendergast: Now I know why I felt the inspiration going out of me ever since you left. (Laughter.) I suppose I have been assigned the subject, "The Rose as a Teacher," because I have been a teacher myself, all my days. It seems strange to me that in a gathering of this character an old granger like I am should be called upon to talk about the loveliest flower in existence. In the part of the country where I live, it is always the custom to put the little wheels forward and let the big ones bring up the rear.

President Underwood: This is a bicycle arrangement where the little wheel steers the big one.

Professor Pendergast: Well, perhaps it is not so bad after all, because the admiration and love of flowers does not belong to any one class. It is not governed by any age or class or previous condition of servitude (laughter), so perhaps an old fellow like I am can see something in flowers to admire, and can see some usefulness in a flower.

My mind goes back to more than thirty-seven years, to the time when I first came to Minnesota, and after I had wallowed—that is the word—from Minneapolis through those big woods where there never was a rose, and got on to the great bleak prairie, climbed up on a little hill and looked away towards the sunset—it was about the time of sunset—to where it extended black as Erebus and as desolate as the Sahara and as measureless as the sea, I said to myself "what kind of a country, what kind of a region is this that you have come into?" (Laughter.) But I was not inclined to put my hand to the plow and look back, so I stayed, and after a few weeks what a marvelous charge came over the face of the prairie! The green prairie grass sprung up, and ten thousand flowers sprinkled that valley and dotted the meadows. They decorated the hill side and adorned the prairie, and it seemed to me then that this was a goodly land. Well, the existence that had been so dull and dark and dreary had completely changed, and life seemed to be all joy and happiness. The appearance of those lovely little flowers all around me changed the aspect of affairs completely. Those little flowers were teaching the lesson and setting the example we should all learn and follow; they were living and doing good to others.

I think of a story that I translated from the French years ago. It was of philosopher who made up his mind that all there was in this world was happiness, and so he set out in pursuit of it; it was always a little ahead of him, and it tantalized him to so often almost reach it, and then have it slip away through his fingers. In his search for it he saw that the government stood in his way, and plotting for its overthrow he was thrown into prison. While there, walking in the dusty court with its high perpendicular walls on each side, he saw between the tiles of the courtyard a green leaf. He went on, stopped, turned about, went back, got down on his knees and examined it, and went into his little cell and took the case knife that he had to cut his bread with and picked away the tiling on each side to give it room to grow; then he went into his cell again and got his little cup and poured half of the water in it on to that plant. Every day he did the same. His first thought was of that little plant. Day after day he watched it, for two or three months, and it grew up and burst into full bloom the day he was pardoned out of the prison. He really regretted that he was a free man, because he had taken such an interest in that little beautiful flower.

He said that he had found the happiness there that he had toiled for and struggled for in vain, for years, and the thought came over him that true happiness was living for somebody else, being something, thinking something, doing something that brought him outside of himself. That was the true secret of happiness. (Applause.)

Now, that is what these flowers are doing, and the rose more than any other. It is the queen of flowers; there is no other that compares with it or that dares rival it. Take the æsthetic sunflower, for instance, it stands stately, grand, rugged in its complaisance; it is the very picture of rugged

honesty. The poppy is a gorgeous flower at a distance, "but it is distance that lends enchantment to the view." The lily is the only one that can at all compare with it, but what a chasm there is between them! Look at the lily fair. I recollect a verse from Bishop Heber's hymn:

"By cool Siloam's shady rill
How fair the lily grows;
How sweet the breath beneath the hill
Of Sharon's dewy rose!"

"Lo, such the child whose early feet
The paths of peace have trod,
Whose secret heart with influence sweet
Is upwards drawn to God."

There is nothing said about the fairness of the lily, but it is the sweetness of the rose.

Matthew Arnold tells us that all there is in this world to strive for is sweetness and light, and sweetness and light is just what the rose has, and what it is giving out all around—sweetness and light. The lily is beautiful and impassively fair, and is just as cold apparently as the marble. It is too geometrically perfect. Each leaf is just exactly on the same plan as every other. It seems to say, "Everything else stand aside. I want this room; I must have just this place." But the rose is just like the lovely woman that has been referred to here to-night, any place, any position, any shape of leaf, but like that lovely lady, no matter what you give her to make a dress of, she will throw it over her in such graceful folds that it will be becoming and beautiful.

And, so, whatever shape the rose takes, it is becoming and it is beautiful. Of course, there are thorns with every rose. We must have the storm to enable us to appreciate the sunshine. I have not much sympathy with Longfellow's man, who was always complaining:

"The day is cold, and dark, and dreary,
It rains and the wind is never weary,
The vine still clings to the mouldering wall,
But at every gust the dead leaves fall,
And the day is dark and dreary.

"My life is cold, and dark, and dreary,
It rains and the wind is never weary,
My thoughts still cling to the mouldering past,
But the hopes of youth fall thick in the blast,
And the days are dark and dreary.

"Be still, sad heart, and cease repining,
Behind the clouds is the sun still shining,
Thy fate is the common fate of all,
Into each life some rain must fall,
Some days must be dark and dreary."

President Underwood: I will ask Prof. Hall to respond to "Roses and the Weather".

Prof. C. W. Hall: *Mr. Chairman, ladies and gentlemen,*—So far as I have been able to read history — natural history — I find that roses have bloomed and weather has prevailed since man came into the world. The roses have been as sweet and they have been enjoyed as much in the past as they are at the present time, and that is very much.

Roses exist to-day in the hottest climes of the world and in the coldest. The Finlander will wrap his robes about him and drive after the harnessed reindeer and will gather roses as he goes. The Abyssinian will sit beneath the shade, and will wave the palm leaf and a bamboo over his dusky mate as they enjoy the fragrance and the beauty of the rose. The rose exists—it grows, it flourishes—in Minnesota. The rose is the queen of flowers, and we have queens in society—queens of flowers and queens of society, and they are both natural. They occur because there is a place for them. These roses and these queens are all about us, and we enjoy them, we encourage their existence and development. We engage in every pastime, in every labor, yes, in every hardship, to secure them.

There is a story told of good St. Elizabeth, which I will relate to you. As she was traveling through the world, she was engaged in giving gifts to the poor. She would gather her apron full, sometimes of flowers, and start out and give them to the worthy poor. As she was passing along one day the king met her, and demanded to know what she had in her apron. She told him sportively, roses. He sternly demanded to see them, and she resisted as long as she could pleasantly, but he was obdurate. He insisted upon seeing them, so she threw open her apron, and, so, an apronful of roses rolled out. (Applause.) So, let us hope that here in Minnesota, with its stern, unrelenting weather, that there may be poured out to us in wonderful profusion and excellent variety, the queen of flowers,—the rose. (Applause.)

President Underwood: "Floriculture in England" is a subject upon which I shall ask Prof. George E. McLean to speak.

Prof. McLean: I am quite intimidated when asked to speak upon this subject of flowers, when I consider all the flowers of speech which have been distributed here to-night by the worthy president and the many colleagues who have preceded me, and especially am I intimidated to speak upon a subject after the regal handling of the queen of flowers by the "flower of queens." (Applause.) Nevertheless, I count myself quite happy that I am permitted to speak upon the subject in a city which promises to be the one in which the first national rose fete shall be held, a city which, certainly, will then be superior to all others as the flower (flour) city. (Laughter.)

I know something of horticulture in England, beginning with the hub of England, London. I will not allude to the horticultural gardens, to the spots given in that magnificent city for this purpose, nor to the exhibits held in the magnificent crystal palace, but I will speak of a few points which may be somewhat unknown to us here.

First of all, of London, of smoky, foggy, dreary old London. One is surprised to find that the streets are full of flowers, literally filled with flowers, scattered in the midst of all the busy traffic. There are handcarts with potted plants, there are barrows with blooming flowers, there are boys and girls with bouquets to sell, and you cannot, day or night, winter or summer, pass through London without meeting with the scents

and the sights of those beautiful flowers. Upon all sides they are offered to you to buy—the most beautiful flowers, flowers imported from France, as well as flowers raised in England, and sold at the most marvelously cheap rates.

What is the result of all this? You cannot enter a home in London, among the rich or poor, where the table is not daily adorned with flowers. They can afford to buy these flowers, and they do so, and the beautiful blossoms stand there, teaching their sweet lessons to all.

Horticulture thrives, then, in London, as may be seen from the hundreds of flower venders moving up and down the streets. Floriculture has become a capital industry in this great capital of the world. Horticulture exhibits its merits as you come to any opening in London.

The wonderful London common council, which is carrying forward such wonderful reforms for London, has been opening up place after place in the city on every side, and wherever there is a square, wherever there is a nook or corner, there you will discover that shrubs have been arranged, well diversified, and flowers made to bloom in their proper seasons. Why, it is a fact that the very churchyards up and down that city, churchyards which even Ruskin said were the places for moss, are being turned into flower gardens, and thrown open to the people. (Applause.)

Horticulture and floriculture! they are seen in every window in London. Even in dusty old Drury Lane, you will discover the very windows full of flowers. The idea of floriculture has become well nigh universal in the city of London. We used to think that the Germans had kept the flowers for their own use, but the English have now followed after them, and as you push out from London now, into the parks and suburbs, there you will find immense beds of flowers on every side.

One of the signs quoted by a great writer upon England, in 1884, to show the wonderful advance of this wonderful people, and their rising above materialism, is this:—that they have lined the entire walk from the marble arch in Hyde Park down to the old gate where the statue of Nelson is, with flowers. We know that old Kensington has been changed into a flower garden, and in the newer parts of the city these gardens are upon every side also.

What has been seen in London is only a culmination of the general love of flowers which has been maintained so long in the country in England. I went into many a cottage in my travels there—a little hovel, where some farmer lived—and I never saw one where there were not the shelves with the flower pots carefully secured upon them. There was never a home so humble in the country of England but that I found flowers there.

So, we see that our Teutonic ancestors in Germany and England have been partial from the beginning to flowers, and that England to-day is progressing out of materialism to that which is spiritual by the cultivation of the many attractive flowers. The cultivation of them is an art as well as an industry.

This, in conclusion, I will say—that the first thing I noticed when I landed in England, and had succeeded after a great deal of difficulty in persuading President Northrop to go to a temperance hotel, was the plants in the windows of a temperance hotel; and the last day, as we

sailed from Queenstown, not far from the city of Cork, the streets and docks were lined with flower venders, all carrying beautiful flowers and especially the little shamrock, which was the prevailing favorite there.

I remember an eloquent old Irish woman who followed us up the street saying, "Buy, buy," as she held out some flowers and shamrock. I remember when I said to her, "But, my good woman, I have no change left,"—having changed my English money, as I was about leaving the country, "I have not a single English penny;" she said, "Well, then, an American cent will do just as well;" but I said, "I haven't got an American cent." And then with the eloquence which I believe must have been born in the Irish from their close communion with the beautiful flowers of their native land, she said, "Well, never mind," and pushing them into my hand, "take them for your good looks." (Applause and laughter.)

President Underwood: I will call upon Col. C. Mc C. Reeve to speak upon "Minnesota Horticulture at the World's Fair."

Col. Reeve: *Mr. President, ladies and gentlemen,*—I feel a good deal like the small boy who, when he was told it was time to go to school by his mother, said, "Well, ma, I am sick." "Very well, George, you go up stairs, and I will bring you up some medicine." "Well," he says, "I ain't sick enough to take medicine, but I am sick enough to stay at home from school." (Laughter.) Now, I am not sick enough to be away from this pleasant gathering this evening, but I feel altogether too sick to say anything. (Laughter). However, as this matter of horticulture at the World's Fair seems to have been thrown at me, and as I am extremely anxious to square myself with this society, I want to tell you briefly some of the obstacles that have been thrown in our way in attempting to keep even the very moderate appropriation that has been made for your society at the coming exposition.

When we began to discuss the different industries among which this appropriation should be divided, somebody said, "Well there is the State Horticultural Society, I don't suppose they will need very much, for this is not a fruit-growing state, and we cannot compare in our fruit with other states."

I didn't know very much about it, I am sorry to confess, but I had been down to your president's gardens one summer, when our regiment was encamped there, and I distinctly remembered eating so many raspberries that it was with difficulty they could get me back to camp in the ambulance. (Laughter.) I believe there are some three thousand varieties of raspberries and strawberries raised in the state. (Laughter.)

I said, "You are mistaken about this matter. I am credibly informed that there are at least seven hundred varieties of apples raised in this state". (Laughter.) The president said, "That is very remarkable. (Laughter). If this industry has grown to such proportions in the state, and we are really such a fruit-growing state, I think it is very proper that we should have a large appropriation for that purpose."

Starting on that line, we rather talked these other people down, that didn't know much about apples and berries, and succeeded in getting what we have for you, and I assure you I will use my best efforts to increase this to such a figure as may successfully enable you to make a display, which I know you can make. (Applause.)

The question of horticulture at the World's Fair at present is in rather a chaotic state. Nobody seems to know exactly what they propose to do, and I do not suppose they know themselves. I thought that this society should have a desirable place and I thought I would get it large enough, say about fifty feet square, and I think we got a place about ten feet by forty feet, very small. I knew that whatever space this society received would be well filled, and that it would make a display there that would not only be a credit to themselves, but a credit to the country at large.

We often hear that we have to go away from home to know how important we are at home, and what advantages we enjoy. I have wandered through the gardens of Paris and Florence and Rome; I have seen the splendors of the botanical gardens in Cairo and Constantinople; I have gazed in admiration at the wonders that were displayed in the Royal Botanical Gardens at Berlin and St. Petersburgh, but I can say in all truthfulness that I have never seen such a magnificent display as any of you may see if you choose to go down and visit the greenhouses of my friend, Mr. Mendenhall. (Applause.) We are far in advance of most of the other nations of the world in this great question of floriculture, and as for horticulture, so far as it relates to fruits—my reputation as a truth-teller is fairly good in this community (laughter)—so probably you will believe me when I say that last winter in St. Petersburgh I saw pears that were selling at seventy-five cents apiece, and apples that were worth sixty cents apiece. The man who was selling them, said they were very cheap because the supply was very large; and I said to him, "Well, I come from a country where we have some fruit, but we never put these high prices upon them; where did these pears come from?" "Well," he said, "we have had a great deal of trouble in getting them, but they all came from California." I suppose if I had asked him in regard to the apples, I would have found out they had come from Michigan or Minnesota, for I have certainly seen better apples in Minnesota than I ever did in Europe. (Applause.)

Now, I am deeply impressed by the earnest manner in which your officers have taken hold of this matter, and by the splendid preparation they have already made in the collection of various varieties of fruit, etc., which have been carefully prepared for this exhibition, a large number of varieties being placed in cold storage, I am told. I am certain that Minnesota will be well represented, and as creditably represented as any state that will have a show at Chicago. (Applause.) I know you can do it. I know you have not only the determination to succeed in this matter, but you also have the means at your command.

I can only say that although there has been at different times a little doubt as to what you might be able to do among members of the commission, at present they are heartily in accord with you, and you will find that they will second your efforts in this matter as cordially as you would wish them to.

I must confess that I don't know much about this subject. When I was speaking about the matter before the meeting this evening to my wife, I said, "I suppose I will have to say something on this subject, about the flower business in Minnesota, or something of that kind."

"Well," she said, "that is an easy matter enough for you. You are a miller and can say something about Pillsbury's Best and so on." (Laughter.)

I said, "That is not the kind of flour they are going to talk about to-night." (Laughter.)

So, Mr. President, without getting any further beyond my depth, I will close as the Irishman did his letter. He started out: "Dear Father:—Having a short time at my disposal, and not nothing else to do, I take my pen in hand to write a letter to you, and having nothing to say I will now close. Your affectionate son." (Laughter and applause.)

President Underwood: The list of speakers has been exhausted, but there yet remains a few formalities before we can adjourn this annual meeting of the State Horticultural Society. I will ask the committee on final resolutions if they are ready to submit a report.

The committee through its chairman, Mr. Clarence Wedge, submitted the following report:

FINAL RESOLUTIONS.

Resolved, That the warm-hearted hospitality of the citizens of Minneapolis, shown to the members of our society during this meeting, deserves our hearty thanks.

Resolved, That the thanks of the society are due to the proprietors of the Lumber Exchange building for the use of rooms so admirably adapted to our purposes.

Resolved, That we most sincerely thank Prof. B. E. Fernow of Washington, D. C., for his able address and inspiring presence with us.

Resolved, That the press of the city, which has given such excellent reports of our proceedings, has materially helped us in our work.

Resolved, That the thanks of the society are due to the enterprising florists, who have filled our rooms with the beauty and fragrance of their flowers.

Resolved, That the officers of the society, and particularly the secretary, who have labored so untiringly and successfully for the interests of the society, have placed the membership under an obligation of gratitude which we shall endeavor to repay by our most earnest co-operation.

Resolved, That, having greatly enjoyed this delightful entertainment provided for us by Mr. and Mrs. Dorilus Morrison of Villa Rosa, we thank them for the interest they have taken in our society and assure them that through many days of toil the memory of this delightful occasion will go with us.

CLARENCE WEDGE,
MRS. JENNIE STAGER,
O. F. BRAND,
Committee.

President Underwood: Ladies and gentlemen, for a good many years I have been an active worker in the society, and I had hoped that I might long remain so I assure you that when you chose me a year ago to occupy the important position of the president of the society, I accepted it with a great many misgivings, because I feared that, following my illustrious predecessor, I might in some way fail to see the prosperity of the society as fully carried out as it had been in the years gone by. I am very glad to know to-night that the past year has been a prosperous one for us in our society, and that we are at least as well off as we were a year ago—yes, better off. The very pleasant recollections of the meetings which we have held this

week will always be a source of pleasure to me as I remember them, and I hope that one year from now, when we meet again I shall have the pleasure of seeing you all; and that the intervening time will be days and weeks and months of pleasure and happiness and prosperity to you all. (Applause.) I do not know that there is anything further before the society, and I think a motion to adjourn would be in order.

Mr. C. L. Smith: I move that we now adjourn.

Motion seconded.

Mrs. Dorilus Morrison: I would amend that by suggesting that we adjourn to the dining room.

Amid laughter, the motion was unanimously carried.

Refreshments were then served, after which, with many expressions of pleasure for the very enjoyable entertainment of the evening, the party dispersed, and the twenty-sixth annual session of the Minnesota State Horticultural Society came to a happy close.

COLUMBIAN EXPOSITION.

MINNESOTA HORTICULTURAL EXHIBIT AT THE COLUMBIAN EXPOSITION.

A. W. LATHAM, SUPT., EXCELSIOR.

Mr. President and members of the Minnesota State Horticultural Society:

At the last annual meeting you passed a resolution requesting the Minnesota Board of Managers of the Columbian Exposition to appropriate $15,000 for a horticultural exhibit from this state, and recommending the appointment of your humble servant as superintendent of the exhibit. The resolutions were promptly transmitted to the board, and the executive committee of this society met with them soon after, when the subject of the exhibit was considered.

The importance of getting to work at once in preparation for the exhibit was recognized by all parties, but, unfortunately, the commission at this time had not collected the money which they must necessarily have to go forward, and it was not until late in the summer that a sufficient amount of the pledges had been received to secure the commission in taking active steps in the matter.

Early in August the commission finally made an appropriation of $5,000 as the full sum which was to be used for the purpose of the horticultural exhibit, including fruits and vegetables; and the appointment was tendered to me as superintendent of the exhibit. The amount received was much less than the smallest sum which had been considered by the executive committee absolutely necessary to make a creditable show. But the board of commissioners, in considering all the various interests of the state that were clamoring for recognition, decided that this was all that could be spared for this purpose.

It was, of course, a disappointment to our committee, and we were compelled to curtail very considerably the outline plans that had been prepared. It had been the intention to put up in glass jars a full line of all the small fruits in their season, and, finally, the grapes and apples, so that a full show of the various fruits grown in Minnesota could be upon the tables in this form during the entire exposition. Of course, nothing had been done in the way of small fruits, and at the date of the appropriation it was too late—scarcely time being left to make the necessary preparation for putting up the fall fruits and securing those needed to place in cold storage, to be used at the opening of the exposition.

In much perplexity as to the best plans to be pursued in canning this fruit, an industry with which no one in our state of whom we could learn was familiar, information was sought from the best sources attainable; and, while relying upon this information in proportion to the value of the source, it was not always found to be reliable, and the results were correspondingly discouraging.

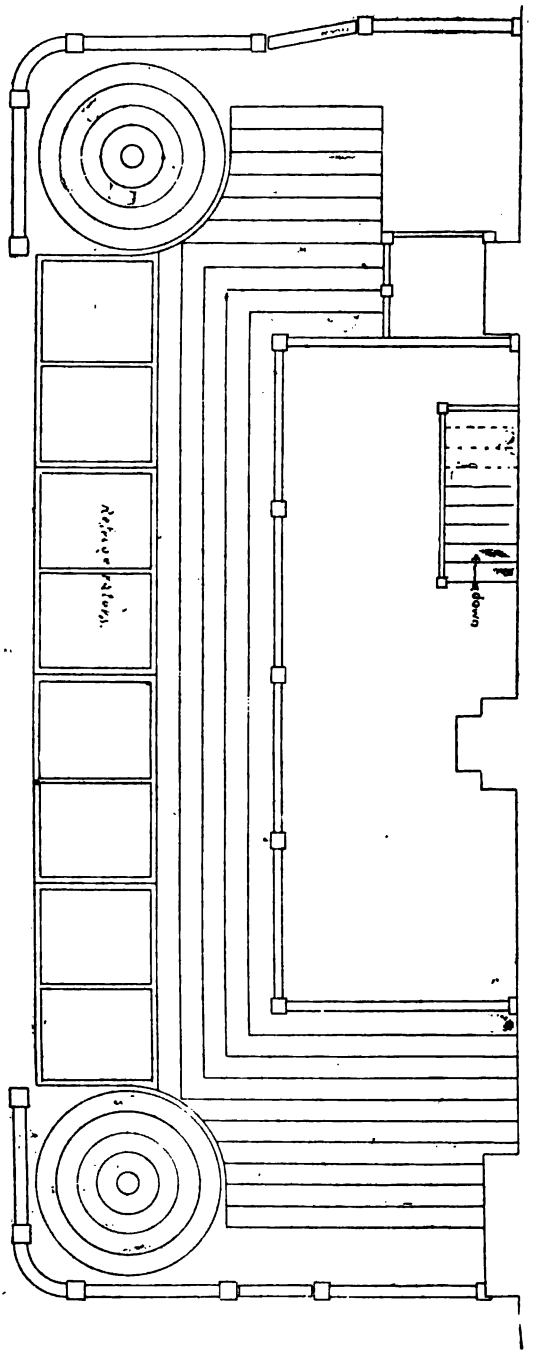
The first step in actual work was to call upon the members of the horticultural society and other fruit growers for contributions of fruit for this purpose. It was fortunate for the superintendent that he combined in his person at this time also the office of secretary, and had the apparatus and the machinery of the society in his hands to aid in pushing forward the work, for which there was then so little time. Members of the society responded promptly to the call for fruit, and nearly everything of value ripening in the state at this season came to me as fast as they could be taken care of.

About a hundred and seventy-five different kinds of fruit were received from different persons, of which some 125 were apples and 35 were grapes and a very few were plums, as you are well aware there were few good plums this year and these hard to find. In requesting the members to forward this fruit, it was not asked as a gift, but the spirit of interest throughout our membership in this matter prompted them to refuse compensation almost without exception; and the fruit was often sent in much greater quantity than was requested or needed. A part of this surplus went to Chicago into cold storage, and a box containing some twenty different varieties was stored in Minneapolis, and they are on exhibition at this meeting.

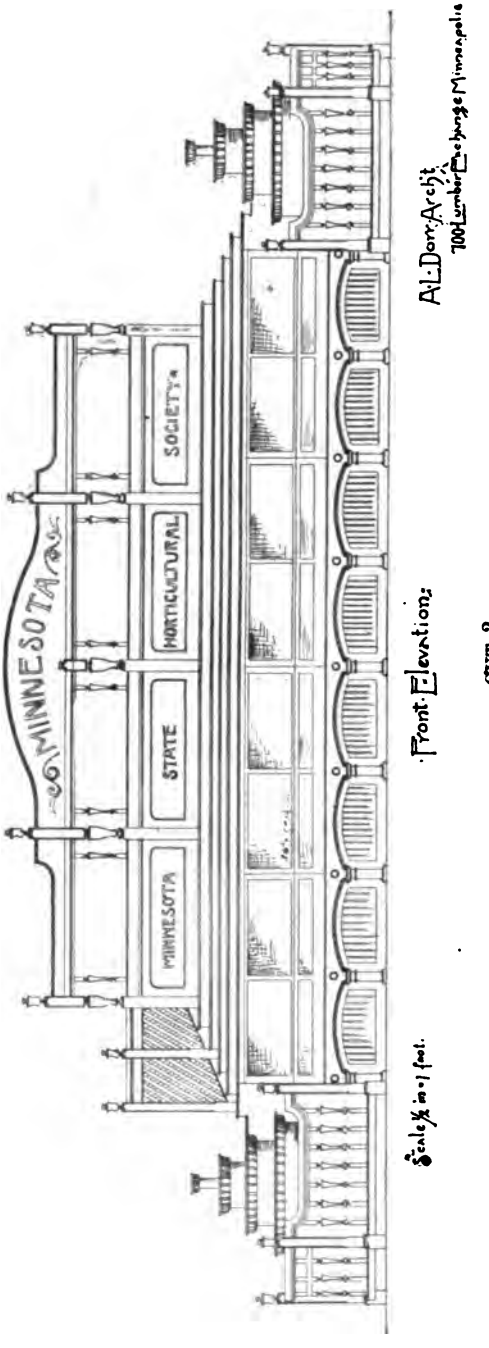
Of the fruit put up in jars, following the best directions attainable, unfortunately, a number of the very best specimens of early grapes and apples failed to keep and necessarily were thrown away. The jars were filled later with other varieties, but the result was to reduce somewhat the number of varieties exhibited, which is much to be regretted; but it was the unavoidable result of inexperience.

The final result of this canning process is about 200 jars, most of them in good condition, now stored in my cellar and awaiting shipment to Chicago in the early spring. Besides this, sixteen barrels and a few boxes of apples of the later keeping varieties, some 25 different kinds, were sent properly packed and placed in cold storage in Chicago. These apples it is the intention to place on exhibition when the fair opens, and keep up an assortment, replenished from time to time from the cold storage as long as they last. A few boxes of grapes packed in cork dust were also stored in Chicago for the same purpose.

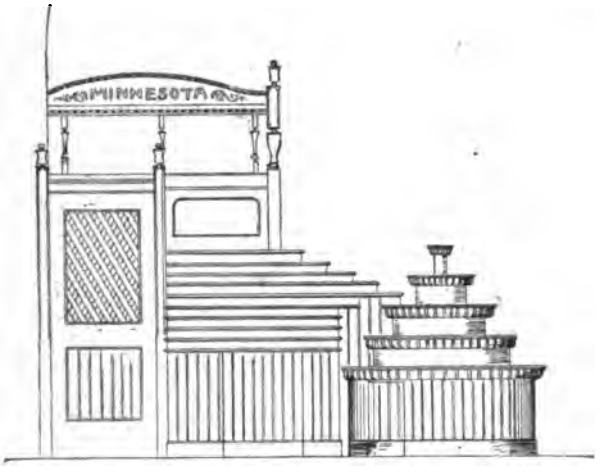
At the time of the attendance of Mr. Elliot and myself upon the American Horticultural Society in Chicago, we took the opportunity to visit the horticultural hall at the exposition grounds and made a selection of an excellent location for the Minnesota fruit exhibit. It is forty feet long by fifteen feet wide, and lies between the main aisle and the inside wall, which borders the aquarium court. As neighbors, we have the Iowa exhibit on one side and the exhibit of Russian apples directly opposite us, so we are in excellent company. Plans for the use of this space are being prepared, a sketch of which I have here and which I shall be very glad to have the members examine and criticise and offer suggestions upon freely. (See cuts). A prominent idea in arranging this plan has



PLAN.
CUT 1.


MINNESOTA
STATE
HORTICULTURAL
SOCIETY
Front Elevation.
Scale ⅛ in = 1 foot.
A. L. Dorr, Archt.
700 Lumber Exchange Minneapolis

CUT 2.



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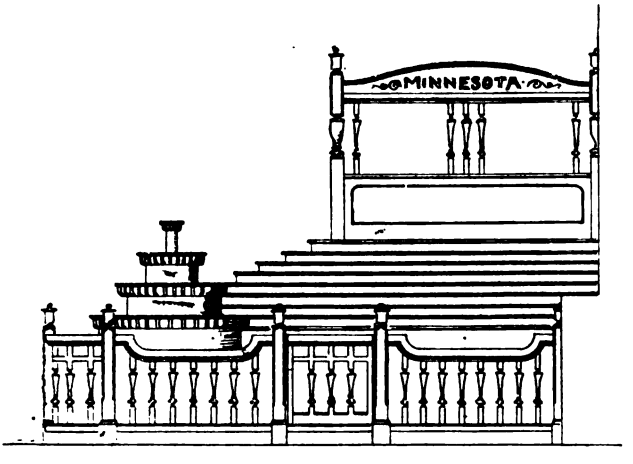


End Elevation.

been to provide a home at the exposition for the members and friends of the Minnesota State Horticultural Society. An inspection of the plans will show the arrangements that have been made with this end in view. Some one will always be in attendance there, and our friends and members will always be more than welcome to the hospitalities of the Minnesota fruit exhibit.

The first five rows of shelves for the display of fruit, as they appear in this plan, are within refrigerator cases with double glazed covers, where it is intended to display the fruits that have been kept in cold storage over winter, as well as small fruits of all kinds to be shown fresh as they ripen. These refrigerators will be cooled either by an ice box extending the whole length behind them, or else by cooling pipes from a refrigerator plant outside the building. These cases will hold about 200 plates.

Aside from the refrigerators, the shelves are planned to hold about 300 plates of fruit besides the 200 glass jars, which will, probably, be shown on the circular structures appearing at each end of the exhibit. Besides the fruit, a seed exhibit may be placed at one end of the plan, next the wall. This is to be prepared by a local firm.

It is decided further to adorn these shelves in some way with decorative plants and vines, either scattered about or suitably arranged in groups. No plan has been decided upon for this decorative portion of the exhibit, and suggestions will be gladly received from any one. It is intended as far as possible to make use of plants native to our state, although there is probably no objection to displaying those that are cultivated in Minnesota floral establishments and homes, the object being not so much to exhibit varieties of plants as to decorate the whole.

Circulars have lately been sent out by the superintendent, very generally enclosed with the program of this meeting, asking for full lists of fruit now growing and likely to bear the coming season. A large number of these lists have already been returned, indicating an immense source from which to draw, but, in order to be sure of finding everything valuable, it is necessary that a very full list should be secured from as many as possible of the growers of the state. In this, as in other matters where the friends of horticulture have been asked for assistance, the response has been prompt and hearty.

As to an exhibit of vegetables, while they properly belong in the horticultural class, as it turns out that they must be shown in a separate part of the horticultural building, requiring the expense of an additional attendant, it appears to be a more economical plan to make this display in connection with the agricultural exhibit of the state. Besides, the amount set apart for horticulture is scarcely large enough to admit of a good exhibit in both vegetables and fruits, and of the two it is more for our interests that a first-class exhibit be made of the latter. This subject is still under consideration.

The method and order of exhibition during the continuance of the fair is to be something as follows: At the opening, May 1st, the fruit on exhibition will consist of the glass jars and the apples and grapes now in cold storage. These last two will continue on exhibition as long as they hold up, renewing as is necessary. Fresh small fruits in their season, beginning with strawberries, then raspberries, etc., will be exhibited in sufficient quantity to fill the refrigerator cases, to be renewed as often as is necessary during the fruiting season, extending the time of exhibition as far as possible by preserving a quantity in cold storage.

The greatest exhibit will be in the fall months, when it is expected that the show of apples and grapes, intended to include every variety growing in the state, will cover all of the shelves provided for that purpose.

Premiums will be offered by the exposition management for various kinds of fruit in their season. The list has not yet been sent out, and I have no idea what its character and scope will be. Probably, fruits entered for premiums will not be shown with the state exhibit, but will be placed with fruits from other localities, entered for similar purposes. Minnesota will try to capture some of these premiums, and I shall see that the members of this society are informed as to their opportunities in this direction as soon as they are known.

A number of photographs, some of which you see on the walls of this room, have been prepared to adorn our exhibit. These that you see here very appropriately show our apple and grape resources, being taken at the time of the last state fair.

The World's Fair committee, which was appointed to act in connection with the superintendent, has been of much practical assistance and should certainly be continued with the same power as at present, although in a work in which the society at large takes so great an interest every member should be, by virtue of his membership, one of a committee to advise and assist, and be entitled, as well, to any credit that may come to the society or the state. A continuance of the spirit with which the labors of the superintendent have so far been met will make it easy for this work to proceed to a successful completion; and it is my earnest purpose to carry it forward in such a way as to secure to you and the state you represent in this interest the largest possible results.

VEGETABLES AT THE COLUMBIAN EXPOSITION.

JOSHUA ALLYN, RED WING.

To the members of the Horticultural Society:

Your secretary, Mr. Latham, urged me to write a paper on the best method of an exhibit at the World's Fair of the vegetables for Minnesota. I hope for your sake some one better qualified will have a chance at this subject, but I will give my thought to help it along. I should think the most important part of this work would be to select a fine line of articles in order to have the very best of all productions. Competent judges must make these selections. "Any man may grow a perfect article, but not every man may know it."

Minnesota need not take a back seat in the growing of vegetables.

Some men have special pride in growing extra fine articles of certain kinds; these should not be overlooked.

Can we place an exhibit there at the opening of the fair, and keep it as it ought to be, is a question with me.

The first of May allows mostly winter vegetables; of course, these are not expected to last perfect very long. The early spring ones, as lettuce, radishes, etc., need a fountain and much attention to keep in good shape even a few days. My idea is to make a fine exhibit the first of September, and with proper care given to selection this can be done to our credit—and I hope Minnesota's best may be there. I intend to grow something for that object.

My experience at small fairs has been that oddities, novelties, most any thing queer or strange, attract the most attention, and even a statue, made entirely of vegetables, is a wonder. Even the best of an article will not attract attention unless arranged with proper taste and order.

THE FORESTRY EXHIBIT AT THE WORLD'S FAIR.

J. O. BARRETT, SECRETARY MINNESOTA FORESTRY ASSOCIATION.

Never in human history was a public enterprise of so gigantic magnitude and so far reaching and beneficent in its educative influences, working international unity and peace, as the World's Columbian Exposition. It is the work of the brain and heart of the American Republic, transformed into an invite for all races and nations to representatively assemble in Chicago this very year to view the wondrous mechanism and development of the age in which we live, and to council together how to bring humanity into closer fellowship and co-operative interest.

In this grand illustration of a world's common civilization, and in the sisterhood of states, Minnesota has the position to which she is entitled to picture in practical form her immeasurable resources of wealth and her advance along the inventive and industrial lines. Conspicuous in her exhibit, as a co-factor, is forestry. For its success the state commissioners have been liberal to the best of their means.

A lively interest is manifested by lumbermen, horticulturists, pomologists and lovers of sylvan culture generally.

In accordance with the recommendation of our association, the writer was appointed superintendent with C. L Smith, assistant. We shall exhibit in practical form all the principal species and varieties of our native and planted timber trees, both indigenous and non-indigenous, adapted by experimentation to the climate; also, a goodly display of shrubs, vines, flowers and mosses from different parts of the state. Our department, like the rest, will be educative as well as attractive in all its phases, and we can reasonably anticipate that it will be a credit to Minnesota.

REPORTS OF DELEGATES.

REPORT OF DELEGATE TO SOUTH DAKOTA HORTICULTURAL SOCIETY.

C. W. H. HEIDEMAN, NEW ULM.

The South Dakota Horticultural Society held its fourth annual meeting at Yankton, South Dakota, Dec. 13, 14 and 15, 1892. Your delegate soon after his arrival met President Warner and others of the little band. Several times he lost his breath, and nearly fainted away listening to descriptions of the wonderful climate, soil, and fruits of South Dakota; however, within a few hours he was on good terms with them, having been sworn into the service, renounced all allegiance to Minnesota as a state to live in, became a full-fledged Dakotian, and could tell as many fish stories as any of them.

The exhibit of fruits and flowers was varied and very fine. Apples were there in great variety, also a large collection of canned fruits, native and cultivated. A plate of Soulard crabs were as fine as I have ever seen. Your delegate was made an honorary member and pressed into service, being placed on the committee on awards and president's address.

The sessions, while not largely attended, were very interesting, and the papers read covered the general field of horticulture. The discussions that followed brought out many points. The committee on revised fruit lists made the following report:

Mr. President and members of the South Dakota State Horticultural Society:

Your committee on revision of list of recommended fruits for South Dakota beg leave to submit the following report, viz: That we have divided the state into three districts, in such manner as seems to us will best represent the different climatic conditions.

For the north district, comprising all of that part of the state lying north of a line running east and west along the north line of Beadle county, we would recommend the following:

Apples—For trial, Duchess, Hibernal, Wealthy and Whitney's No. 20.

Crabs—Early Strawberry, Briar's Sweet, Minnesota, Orange, Transcendent, Hyslop and Quaker Beauty. For trial, Snyder and White Arctic.

Plums—Desota, Forest Garden, Rollingstone, Wolf and selected natives.

Cherries—Dwarf Sand.

Grapes—For trial, Clinton and Janesville, with winter protection.

Currants—Victoria. Long Bunch Holland, Red Dutch, White Grape and Cherry.

Gooseberries—American Seedling and Houghton.

Raspberries—Reds; Turner and Philadelphia, with winter protection.

Blackberries—For trial, Lucretia dewberry.

Strawberries—Crescent, fertilized with Chas. Downing or Wilson. For trial, Warfield No. 2, Haverland, Windsor Chief and Bubach, fertilized by Mount Vernon and Jessie.

For the central district, comprising all counties north of the north line of Hutchinson and Turner counties, and south of the north district, which includes most of the Hills district:

Apples—Duchess, Wealthy, Hibernal and Whitney's No. 20. For trial, Pewaukee, Yellow Transparent, Scott's Winter, Zoloteriff and Anis.

Crabs—Early Strawberry, Briar's Sweet, Minnesota Orange, Transcendent, Hyslop, Martha and Quaker Beauty. For trial, Snyder, White Arctic and Virginia.

Plums—Desota, Forest Garden, Rollingstone, Wolf, Harrison's Peach and Hawkeye.

Cherries—Dwarf Sand. For trial, Wragg, Ostheim and Early Richmond.

Grapes, with winter protection—Concord, Janesville, Moore's Early, Worden, Clinton and Martha.

Currants—White Grape, Victoria, Long Bunch Holland, Red Dutch, Cherry and Black Naples.

Gooseberries—Houghton and American Seedling.

Raspberries—Blacks; Souhegan or Tyler, Ohio and Gregg. Reds; Turner, Philadelphia and Cuthbert.

Blackberries—Lucretia dewberry.

Strawberries—Same list as for north district.

For the southern district, comprising all counties south of the north line of Turner and Hutchinson counties, we recommend the following:

Apples—Duchess, Wealthy, Whitney's No. 20, Hibernal, Scott's Winter, Pewaukee, Haas, Walbridge, Yellow Transparent, Perry Russett, Fameuse and Price's Sweet. For trial, Zoloteriff, R. Anis, Charlamoff, Antonvoka, Utter's Red and Iowa Blush.

Crabs—Early Strawberry, Briar's Sweet, Minnesota, Orange, Hyslop and Quaker Beauty. For trial, Snyder, White Arctic and Virginia.

Pears for trial—Bessamianka, Fiemish Beauty, Seckle and Keiffer.

Cherries—Early and Late Richmond, Wragg and Ostheim.

Plums—Desota, Forest Garden, Rollingstone, Wolf, Hawkeye, Miner, Harrison's Peach, Egg, Early Red and Wild Goose.

Grapes—Concord, Janesville, Worden, Moore's Early, Agawam, Martha, Lady Clinton, Massasoit, Delaware and Wyoming Red.

Currants—Same as recommended in central district.

Gooseberries—Houghton, Downing, Smith's Improved and American Seedling. For trial, Industry.

Raspberries and Blackberries—Same as recommended for central district.

Strawberries—Same as north district.

GEO. H. WHITING, Chairman.

The committee on resolutions reported the following resolutions to which the attention of this society is called.

Resolved, That the mixed nomenclature of various fruits now successfully raised in South Dakota needs correcting, more especially in view of the coming flood of native plums. This work of identification should be done systematically and with a view to permanency, special reference being had to such varieties as are now of general or local reputation, and provision should be made for future additions to the list.

Resolved, That we invite the state horticultural societies of Minnesota, Wisconsin and Iowa to join in the perfection of plans tending to bring order out of chaos now existing, and which must necessarily continue and increase with the advent of new varieties.

The officers and members of the Dakota society feel grateful to our society for our annual reports. Their society receiving no aid from the state have, heretofore, published none of their proceedings. "The Dakota Farmer," however, this year (issue of January, 1893) published in a special horticultural number their entire proceedings.

The following officers were elected for 1893:

H. C. Warner, president, Forestburg.
D. Hinman, 1st vice president, Yankton.
Chris. Thompson, 2nd vice president, Rapid City.
E. D. Cowles, secretary, Vermillion.
T. L. McCrea, treasurer, Tyndall.

DIRECTORS.

Chris. Thompson, 1st district.
Hon. Geo. B. Daly, 2d district.
Col. A. B. Smedley, 3rd district.
George C. Jones, 4th district.
A. Norby, 5th district.
J. J. Schumacher, 6th district.
George H. Whiting, 7th district.
Mr. Jones, 8th district.
J. M. Miles, 9th district.

The next annual meeting is fixed for the third Tuesday in December at Vermillion, S. D.

REPORT OF THE DELEGATE TO THE SUMMER MEETING OF THE WISCONSIN STATE HORTICULTURAL SOCIETY HELD AT BARABOO, WIS., JUNE 29, AND 30, 1892.

J. S. HARRIS, LA CRESCENT.

Mr. President:

It has been my privilege to attend a considerable number of the meetings of our neighbor, the Wisconsin State Horticultural Society. The meetings have always been good and instructive, and we have always been most cordially received and royally entertained. We believe, too, that our meetings with these Wisconsin friends have been of benefit to our own state and society, and that our intercourse with the old veterans of Wisconsin has given us opportunities to do more and better work for our own state. The trials they have to encounter and the obstacles to overcome are similar to ours in kind, but not quite as great in degree, because their state is older than ours, and one-third of it better situated than ours for the successful cultivation of the tree fruits, on account of the influence of that large body of water, Lake Michigan, upon the climate.

As you are, probably, aware, their winter meetings are usually held at the capital, and are made, partly, joint meetings with the State Agricultural Society; while the summer meetings are held at different points in the state, where it is thought the most good may be done. With each year the interest in these summer meetings has grown, until they have really become the best and most important gatherings of the society. Baraboo, being situated in the center of one of the best fruit districts of the state, was a very favorable place for holding this meeting, and success

was assured from the start. In fact, no kind of a horticultural meeting held in such a beautiful place, and with so many such wide-awake, intelligent, enterprising horticulturists as Tuttle, Toole, Hirschinger, Fox, Townsend and a dozen others, with the general, M. A. Thayer, to preside over their deliberations, could be anything but a success. The program was a timely one and the topics were well handled, while the attendance was good and deeply interested.

The first session was devoted to papers on the best and most profitable methods of growing and marketing small fruits, and varieties for cultivation, by Henry Tarrant and J. W. Loudon of Janesville and E. C. Tobey of Sparta; apples in Wisconsin, how to grow and market them, by Chas. Hirschinger of Baraboo; and experiments at the government station at Ithica for the preventing of fungus diseases of the tree, fruits &c.; and the extermination of insects, by Prof. Goff of Madison and A. L. Hatch of Ithica. According to their reports, by spraying at the proper times with the Bordeaux mixture, eau celeste and other fungicides, as recommended and formulated in the bulletion of the U. S. Dept. of Agriculture, apple, leaf and fruit scab, rust on strawberries and such like diseases can be prevented, thus causing the trees to grow more vigorous and healthy, and produce more and better fruit.

The papers and discussions on small fruits elicited that for the Northwest the matted row is the best method of growing strawberries; that rust and fungus diseases were much more prevalent this year than ever before, and that while we have a plenty of good pistillate varieties of strawberries, we want more good, hardy, reliable pollenizers. Michel's Early, Sandoval, Crawford, Gandy, Bederwood, Jessie and Parker Earle were suggested as among the best now known. But the Michel is not very valuable for fruit, the Sandoval and Crawford rust badly and the Jessie is too weak in a season like the present. One of the greatest factors in profitable fruit growing is the marketing. All fruits should be picked carefully without bruising, should be of even ripeness and size, put up in new clean packages and be thrown upon the market in the most perfect and showy condition. If a few small knotty and inferior specimens are put in, the whole package must sell as if they all were of that grade.

At the evening session considerable time was taken up on the question of Arbor Day in schools. "This day was first observed in Nebraska in 1872. In 20 years it has grown to be observed in 35 states, and in many other sections of the world. Its mission is not only to teach the planting of trees for their utility and protection, but for their beauty, and the lesson taught on the school grounds prompts the child to ornament and beautify the home." At the previous winter meeting, President Thayer offered to donate 6,000 strawberry plants to school children who might organize and apply for them under certain rules, the result being that the children of 205 schools so organized associations and 8,358 plants were sent to 1,393 applicants, mostly by mail, free, and were planted in the homes of some twelve hundred children. It is proposed next year to offer 30,000 plants to 5,000 children on same conditions. This is giving the society an opportunity to get into intimate communication with the families of the state that they could not otherwise have, and it is sowing the seeds from which will be gathered a magnificent crop of pratical horticulturists. A number of the reports from the recipients of these plants were read before the meeting and were intensely interesting. The remaining ad-

dresses and acts of the meetings were equally interesting and important and fully occupied the time of the five sessions, and at the final adjournment all expressed themselves satisfied with the meeting. The exhibition of fruits and flowers in connection with the meeting was fine. It consisted of large and well arranged collections of blooming plants and splendid displays of roses, pansies and other cut flowers, and upon the fruit tables there were displayed over 100 varieties of strawberries; and the quantity, quality and appearance was an agreeable surprise to all, because it had been very generally supposed the season had been generally impossible for the best development and ripening of this fruit.

About forty varieties of new and unnamed seedlings were shown. Most of them were of large size and very attractive appearance, and, probably, some of them are booked for a boom in the near future. Two of the best varieties were named at the meeting, one, the Mead, the other, the Crosby. Another variety—fruit of large size, good appearance and having perfect flowers—which this year ripened its fruit earlier than any other known variety, and brought the highest price in the Janesville market, will be known as Louden No. 2; for the present. The largest berries in the exhibition were a plate of Bubach No. 5; and this variety was generally highly commended by the fruit growers present. The highest prize for the best single variety was awarded to the Warfield; solidity, firmness, color, productiveness and shipping qualities combine to make it the most popular variety for the market.

The first premium on collection was awarded to J. G. Kellogg of Janesville, and the second to the Sparta Fruit Farms. The success of the Wisconsin summer meetings suggests to us of Minnesota that it ought to be to our advantage to rotate around a little more, and get better acquainted with the people, and have stronger programs and longer summer meetings.

REPORT OF DELEGATE TO IOWA.

CLARENCE WEDGE, ALBERT LEA.

The meeting of the Northern Iowa society at Humboldt was in every way successful, and one especially agreeable to your delegate, as orcharding, his favorite hobby, was made by far the leading subject on the program. The proceedings were ably and gracefully presided over by H. W. Ash of West Union, and were throughout destitute of any acrimonious feeling or discussion, which is deserving of remark, as Iowa is the very center of the divergent Russian and seedling interests. Among the varieties of apples that were prominently mentioned were Harry Kaump, an extremely early bearer of rather small yellow apples that keep better than Wealthy; tree not an iron clad, but perhaps hardier than Wealthy and very satisfactory with those fruiting it. Charlamoff was favorably mentioned by several, and the point brought out that two varieties are out under that name; one an upright grower with nearly worthless fruit, and the true Charlamoff, a spreading tree, of fruit and season similar to Duchess but of better dessert quality.

Patten's Greening received only words of praise, and in Northern Iowa, at least, it appears to have come to stay. The Wealthy as a variety for commercial orchards provoked an interesting discussion; about half of those who spoke placed it by the side of the Duchess for profit, while as many,

remembering the reverses of 1884-5, were unwilling to trust it. The McMahon was on the whole rather unfavorably considered, tendency to blight being reported. When the question came up "What two varieties for a commercial orchard of 1,000 trees?" quite a number answering, all placed Duchess first, and Wealthy and Hibernal, the only other varieties mentioned, were about equally divided for second place.

Prof. Budd read a long and important paper on "Valuable Russian Fruits," which, considering that it was prepared for Northern Iowa and is a condensed description of the cream of the Russian apples by the highest authority of the day, should have a place in our report as a whole The value of top working the more tender varieties on extra hardy stocks seemed to be admitted, and some facts were given to show the need of experiment to determine what varieties were congenial.

Two varieties, grown at Humboldt and in excellent keeping condition, were given to many members to test, by Prof. Budd. They were Veronish Rosy, 1277 and Rosy Repka, 200; both were certainly choice eating and were said by him to be hardy enough for Minnesota.

C. G. Patten gave a valuable talk on "Tests of Hardiness." He is one of the most careful and most reliable experimenters in the Northwest, and his presence with us should prove one of the features of our meeting. Prof. Budd stated that a perfect test of hardiness has been discovered by Prof. Halsted, and that it consists in a thimble of starch formed at the points of growth of all hardy varieties. He also gave the results of experiments going to show that in order to originate hardy varieties from seed we should use an iron-clad mother. Elmer Reeves in a valuable paper on plums recommended propagation on their own roots of our native varieties; mentioning Desota, Hawkeye, Forest Garden, Rollingstone, Speer, Weaver, Wolf, Wyant and Rockford as about the best varieties. J. C. Ferris showed a very interesting object lesson in the form of a section of native plum budded on sand cherry about ten years ago. The union was perfect; he also reported the tree somewhat dwarfed and free from sprouts. Grapes received considerable attention. Prof. Budd spoke highly of Moore's Early, which he said needed much longer pruning than most varieties. Worden seemed a prime favorite. Moore's Diamond and Wyoming were mentioned among the promising sorts; as at our last Minnesota meeting, the mention of the Janesville made things lively. The Shaeffer red raspberry and the Older black-cap seemed to be regarded the most productive of their classes. The most marked feature of the evergreen papers and discussion was the high esteem in which the Picea Pungens was held for ornamental planting, the two leading growers of northern Iowa placing it at the head of the list.

The election of officers resulted in the re-election of all except treasurer, to which office Edson Gaylord was chosen. Charles City was made the place of next meeting. It is the duty of your delegate to mention the marked courtesy shown him both by the members and by the citizens of Humbolt, and to recommend our people to secure the published report of the meeting of which the foregoing is but the merest outline.

CLARENCE WEDGE.

LIBRARY.

REPORT OF LIBRARIAN.

The report of the library, located at 427 Nicollet avenue, Minneapolis, shows the presence of at least one copy of all the volumes cited in last year's report.

The following volumes have been received during the current year:

Name.	Year.
American Hort. Society Report	1886
Mahaska Co., Iowa, Hort. Soc. Rep	1892
Indiana State Hort. Society Report	1872
Indiana State Hort. Society Report	1880
U. S. Dept. Bulletin 3, Plant Dis	No. 3
Kansas Hort. Society Report	1883
Kansas Hort. Society Report	1884
Kansas Hort. Society Report	1885-6
Kansas Hort. Society Report	1889
Kansas Hort. Society Report	1891
New York, Western Hort. Soc. Rep	1890
New York, Western Hort. Soc. Rep	1891
Kansas Experiment Station Rep	1890
Kansas Experiment Station Rep	1891
Kansas Experiment station Rep	1892
Colorado Hort. Society Report	1887-8
Colorado Hort. Society Report	1890
Colorado Hort. Society Report	1891-2
Florida Hort. Society Report	1892
Vermont Agricultural Report	1887-8
Vermont Agricultural Report	1889-90
Vermont Agricultural Report	1891-2
California Board of Hort. Report	1887-8
California Board of Hort. Report	1889
California Board of Hort. Report	1890
California Board of Hort. Report	1891
Minnesota State Agri. Society Rep	1891
Illinois Hort. Society Report	1873
Illinois Hort. Society Report	1875
Illinois Hort. Society Report	1877
Illinois Hort. Society Report	1878
Illinois Hort. Society Report	1879
Illinois Hort. Society Report	1880
Illinois Hort. Society Report	1881
Illinois Hort. Society Report	1882
Illinois Hort. Society Report	1883
Wyoming Experiment Bulletin	1892
American Nurserymen's Association	1892
American Florists' Society Report	1887
American Florists' Society Report	1888
American Florists' Society Report	1889
American Florists' Society Report	1890
American Florists' Society Report	1891
Wisconsin State Hort. Report	1891
Massachusetts Agri. Report	1890
Illinois Agri. Report	1877
Illinois Agri. Report	1878
Illinois Agri. Report	1879
Illinois Agri. Report	1880
Illinois Agri. Report	1882
Illinois Agri. Report	1887
Illinois Agri. Report	1888
Illinois Experiment Sta. Bulletin	1888-91
Illinois Hort. Society Report	1890
Illinois Hort. Society Report	1891
American Nurserymen's Association	1891
American Pomological Soc'y Report	1876
American Pomological Soc'y Report	1877
American Pomological Soc'y Report	1881
American Pomological Soc'y Report	1887
American Pomological Soc'y Report	1889
U. S. Dept. Agri ,23 Bulletins	
U. S. Dept. Swine Plague	1891
Bushburg Grape Catalogue	1883
Minnesota Agri. Soc. Premium List	1889
Minnesota Agri. Soc. Premium List	1890
Minnesota Agri. Soc. Premium List	1891
Oregon Board of Hort. Report	1891
Montreal Hort. Society Report	1887-8
New Jersey Hort. Society Report	1889
New Jersey Hort. Society Report	1890
Massachusetts Hort. Soc. Rep. Part 1	1887
Massachusetts Agri. College Report	1892
Wisconsin Hort. Society	1889
Wisconsin Hort. Society	1891
Wisconsin Hort. Society	1892
Wisconsin Agri. Experiment Station	1890
Wisconsin Agri. Experiment Station	1888
Wisconsin Farmers' Institute	1889
Wisconsin Farmers' Institute	1891
Wisconsin Agri. Society Report	1875-6
Wisconsin Agri. Society Report	1881-2
Wisconsin Agri. Society Report	1883
Wisconsin Agri. Society Report	1884
Wisconsin Agri. Society Report	1885
Wisconsin Agri. Society Report	1888
Wisconsin Agri. Society Report	1889
Wisconsin Agri. Society Report	1890
Wisconsin Agri. Society Report	1891
California Board of Hort.	1886
Ohio, Columbus, Hort. Society	
Ohio Hort. Society Report	1888-9
Ohio Hort. Society Report	1890-1
Ohio Hort. Society Report	1891-2
Mississippi Valley Hort. Society	1883
Missouri Hort. Society	1889
Missouri Hort. Society	1890
Missouri Board of Agri	1889-90
Kansas State Hort. Society	1873
Kansas State Hort. Society	1875
Maine State Pomological Society	1890
Maine State Pomological Society	1891
Nebraska Board of Agri	1885
Nebraska Board of Agri	1889
Nebraska State Agri. Society	1892
Texas State Hort. Society	1891
Minnesota Special Laws	1891
Minnesota General Laws	1891
Minnesota Agri. Society	1890
Minnesota Agri. Society	1891
Minnesota Statistics	1885
Minnesota Minneapolis Rep. P'rk Com.	1890
Ontario Fruit Growers' Ass'n	1891
Michigan State Hort. Society	1889

Name.	Year.
Michigan Board of Agri	1877
U. S. Department Agri. Report	1876
U. S. Department Agri. Report	1878
U. S. Department Agri. Report	1879
U. S. Department Agri. Report	1884
U. S. Department Agri. Report	1885
U. S. Department Agri. Report	1886
U. S. Department Agri. Report	1887
U. S. Department Agri. Report	1888
U. S. Department Agri. Report	1889
U. S. Department Agri. Report	1890
U. S. Dept. Bureau of Animals, etc.	1889-90
U. S. Congress, Reports to	1873
U. S. Smithsonian Report	1884
Iowa State Hort. Society	1871
Iowa State Hort. Society	1872
Iowa State Hort. Society	1873
Iowa State Hort. Society	1874
Iowa State Hort. Society	1875
Iowa State Hort. Society	1876
Iowa State Hort. Society	1883
Iowa State Hort. Society	1890
Iowa State Hort. Society	1891
Iowa Agri. Report	1876
Iowa Agri. Report	1877
Iowa Agri. Report	1878
Iowa Agri. Report	1879
Iowa Agri. Report	1884
Iowa Agri. Report	1885
Iowa Agri. Report	1886
Indiana State Hort. Society	1887
Indiana State Hort. Society	1889
Indiana State Hort. Society	1890
Indiana State Hort. Society	1891
Indiana Agri. Report	1875
Indiana Agri. Report	1877
Indiana Agri. Report	1884
Indiana Agri. Report	1885
Indiana Geological Survey	1875
Pennsylvania Agri. and Hort. Soc. Vol 1	
Pennsylvania Agri. and Hort. Soc. Vol 2	
Pennsylvania Agri. and Hort. Soc. Vol 3	
Pennsylvania Agri. and Hort. Soc. Vol 4	
Pennsylvania Agri. and Hort. Soc. Vol 5	
Pennsylvania Agri. and Hort. Soc. Vol 6	
Pennsylvania Agri. and Hort. Soc. Vol 7	
Pennsylvania Agri. and Hort. Soc. Vol 8	
Pennsylvania Agri. and Hort. Soc. Vol 9	
Pennsylvania Agri. and Hort. Soc. Vol 11	
Pennsylvania Agri. and Hort. Soc. Vol 12	
Pennsylvania Agri. and Hort. Soc.	1878
Pennsylvania Agri. and Hort. Soc.	1879
Pennsylvania Agri. and Hort. Soc.	1880
Pennsylvania Agri. and Hort. Soc.	1881
Pennsylvania Agri. and Hort. Soc.	1882
Pennlylvania Agri. and Hort. Soc.	1883
Pennsylvania Agri. and Hort. Soc.	1888
Pennsylvania Agri. and Hort. Soc.	1889
Pennsylvania Agri. and Hort. Soc.	1890
Pennsylvania Agri. and Hort. Soc.	1891
Conn., Hartford Co., Hort. Prem. List.	1891
Conn., Hartford Co., Hort. Prem. List.	1892
Minnesota Historical Society	1891
Minnesota, Its Resources	
Ontario Fruit Growers' Ass'n	1888
Ohio State Forestry Bureau	1888
Montreal Hort. Society	1889

Total number of separate books, not including duplicates, 177.

The present arrangement in regard to the location of a library for the society, while looked upon as only temporary, is perhaps as convenient as can be made at the present time. Our library should be made ultimately the repository of all the horticultural literature extant, and its current accessions should fully keep pace with the increase of such literature.

An effort is being made with some success to secure the numbers missing from the files of reports of the various horticultural and agricultural societies of the country, and, also, to get the bulletins of the various experiment stations as fast as published. Many of these reports and bulletins are in paper covers, and should as fast as possible, together with the various horticultural periodicals coming to the library, be bound substantially in cloth.

There are many works on the various branches of horticulture that can be obtained only by purchase or by gift from the friends of the society. A small amount appropriated annually to this work, combined with a little industry on the part of the librarian and the library committee (which ought to consist of our whole membership), would result in time in getting together a large and valuable horticultural library. A blank book has been prepared in which the volumes of the library will be catalogued alphabetically as they come in and credit be given to the donor. An improvement imperatively needed in the library is some glazed doors to protect the books from dust, which is rapidly discoloring them.

The past year systematic work has been done for the library, and it has not been practicable to do this to advantage before, being without a home for our books, such as is now provided. I trust the result will be found reasonably satisfactory. Respectfully submitted,

A. W. LATHAM, Librarian.

REPORTS STORED AT PILLSBURY HALL, STATE UNIVERSITY, MINNEAPOLIS.

E. A. CUZNER, ASSISTANT LIBRARIAN.

(This report does not include the "Reserve." See report of 1892, page 121.)

Reports of 1876, 255 paper bound; 1877, 29 paper bound; 1881, 875 paper bound; 1882, 114 cloth bound and 503 paper bound; 1883, 350 cloth bound and 231 paper bound; 1884, 268 paper bound; 1885, 425 paper bound; 1886, 189 paper bound; 1887, 43 paper bound; 1888, 42 paper bound; 1889, 125 paper bound; 1890, 156 paper bound; 1891, 216 cloth, 50 paper; 1892, 572 cloth, 950 paper covers. The reserve has been drawn upon three times, *but not touching 1879.*

There have been sent out from the Pillsbury Hall the past year 111 packages, or 1444 copies of the Minnesota State Horticultural reports.

REPORT OF THE COMMITTEE ON LIBRARY.

J. S. HARRIS, LA CRESCENT.

During the year 1892 I have secured the following additions to the library of the Minnesota State Horticultural Society, and have delivered the same at the society's office on Nicollet ave., Minneapolis:

One copy Report of American Pomological Society, 1891, paper; 1 copy Report Secretary of Agriculture, 1891, cloth; 1 copy Report Bureau Animal Industry, 1890, cloth; 1 copy Report Wisconsin State Agricultural Society, 1891, cloth; 1 copy Report Wisconsin State Agricultural Society, 1892, cloth; 1 copy Report Department Agriculture Wisconsin Experimental Station, 1891, paper; 1 copy Report Agriculture of South America, (U. S. Department Agriculture, 1891), paper; 1 copy Report Co-operative Credit Associations of Certain European nations, (U.S. Department Agriculture), 1892, paper; 2 copies Report Food Adulteration, Part 6 and 7, U. S. Department Agriculture, 1892, paper; 1 copy Farmers' Bulletin No. 7, Spraying Fruits, paper; 1 copy Flax Culture for Fiber, paper; 1 copy Secretary of Agriculture, 1892, paper; 1 copy Experiments with Sugar Beets, 1891, paper; 1 copy Experiments with Sorghum, 1891, paper; 1 copy Damage by Destructive Locusts, 1891, paper; 1 copy Inoculation to Prevent Hog Cholera, 1892; 1 copy Wages of Farm Labor 1886-1892; 1 copy Report of Statistics, July and August, 1892; 1 copy. Report of Statistics, September and October, 1892; 10 monthly reports Condition of Crops, 1892; 1 copy Experiments in Treatment of Plant Diseases; 1 copy U. S. Department Agricultural Reports, Crops of the Year, 1891; 1 copy Wisconsin Farmers' Institute Bulletin, 1892.

Your committee would recommend that the books in the library be catalogued as soon as practicable, and that in the distribution of the society's published transactions, 200 or more copies of all back reports be held back for library exchanges and a bonus to those who may hereafter become life members of the society.

AGRICULTURAL CHEMISTRY.

AGRICULTURAL CHEMISTRY.

PROF. HARRY SNYDER, ST. ANTHONY PARK.

Mr. President, ladies and gentlemen:

The subject assigned to me, agricultural chemistry, is such an extensive one that I shall take the liberty of limiting it to a general consideration of some of the present views in regard to the functions of the ash elements in plants.

Whenever a plant is reduced to ashes by burning, there are always definite building materials present, and whenever any of these elementary mineral substances are absent from the soil no plant can live.

Not less than fifty years ago a prize was offered for a solution of the then vexed question, "are the ash constituents necessary to the plant economy, or are they accidental, in as much as the plant takes up such a large quantity of water and so must of necessity take up what mineral matters are in solution, as well?" So it will be seen that what little is known in regard to the mineral matter in our plants is of a comparatively recent date. To the labors of Liebig, Wolf, Knapp and many others, we are indebted for our limited knowledge of the functions of the plant ash.

The methods employed by these men are familiar to many of you—how plants were fed on a carefully prepared mineral diet, in which one plant element was supplied in a meagre allowance and then again in liberal ration.

When lime was withheld from the young and growing plant it was observed that no new organic matter was produced, when withheld from the more mature plants the effect was not so marked. Numerous experiments with this element soon indicated that lime was necessary to the plant in the early stages of its growth. In this regard plants are quite like animals, in as much as they require the larger portion of their lime while young. The mature animal or plant cannot assimilate the lime in its later stages, so that it will take the place of the lime that should have been assimilated in its early stages.

Of magnesium, an element quite like calcium (or lime), only a small amount is required, and in its absence the plant will grow, but the seeds from such plants possess but little vitality. The presence or absence of iron is extremely marked in the plant. When iron is withheld the coloring or greening of the chloryphyle grains cannot take place. Just how the iron effects this change is not known. This mineral occurs in the smallest quantity of any one of the elements, and is seldom absent from any soil.

Potassium, familiar to us as potash, is never found wanting in any plant, and, in general, it is quite equally and evenly distributed in all parts of the plant, and can readily be removed from ashes by leaching. When the required amount of potash is withheld the plants are not vigorous, if all of the potash is removed from the soil the plant soon dies of

potassium starvation. Potash apparently aids in the transportation of the starch grains through the cell walls. Its movements within the plant are in the same direction as the starch. When any plant is unable to obtain its normal amount of potassium, its growth is checked and the plant, in the course of a short time, passes into a decline.

When the different elements that are found in the ashes of plants were first determined, it was supposed that a chemical analysis of the ash would show just what kind of mineral food different plants would require. This idea gave rise to all kinds of speculations, and chemists labored away making chemical analyses of the ashes of plants with the hope of finding just how much and what kinds of minerals should be used for the best results. Finally, these various speculations were put to trial, and then in many cases it was found that the plants grew no better than they did before, showing that there was yet another undetermined factor.

It was shown by Liebig that when a manure pile was divided into two equal parts, and one part burned to ashes and the ashes applied, while, on the other hand, the manure was applied directly to the crop, that the manure when applied directly was far more effectual than when only the ashes were used. Why this difference when there was the same quantity of each available ash element in both cases, and all of the minerals necessary for plant development were the same in each, and yet the practical results were not the same?

The reason for this difference was soon explained when nitrogen was shown to be a necessary element for plant growth. When the manure was burned the nitrogen was liberated and escaped into the air in the form of gaseous combinations, and when the manure was applied directly the nitrogen was available as plant food. There has been more experimenting done with the nitrogen supply of plants than in any other line of similar work, and as the result of all of this labor many valuable results have been obtained. Only a limited number of plants are capable of taking their nitrogen supply directly from the air, while the larger number must be supplied with this element from the soil. The nitrogen supplied for plants and crops is the most important factor, economically considered, of all of the elements that are necessary for plant food. The commercial value of nitrogen is a little more than double that of phosphoric acid, and about four times that of potash.

The necessity for concentrated fertilizers has not as yet made itself felt, and it is to be hoped will not for some time to come, and as long as the local demand for such materials as tankage and dried blood is no greater than it is at present, they will continue to supply us with all the concentrated nitrogen that we may desire for any special purposes.

The draft of horticultural products upon the soil is not great, in fact, it is less than any other branch of husbandry. A hundred pounds of red raspberries take less than one-half a pound of mineral matters from the soil, potatoes less than a pound. The mineral matter that is lost in the weed crop of many gardens is frequently ten times greater than that removed in any ordinary horticultural crop.

The beneficial results of systematic horticulture, especially forestry, are many. A tree always improves a soil by enriching it with the humus formed from the decaying leaves, and the humus then renders more plant food available than the tree has itself taken up; hence, trees cause soil to grow richer and richer.

FORESTRY.

REPORT ON FORESTRY.

MRS. J. H. BROWN, LAC QUI PARLE.

The work of planting and caring for trees is a noble one. As I look at the noble trees, my heart goes from nature to nature's God. Who does not love the trees? I love them and love to work amongst them, and I wish more people took an interest in the work.

The people of this country are doing quite well, having quite a good many nice groves. The trees around here are growing nicely this year; grew very well last year. There has been more rain the last two years, and the cottonwood bugs have not been as bad this year as they have been in the past few years.

The Scotch pine and white spruce and white pine are about the best trees to plant. I think they grow about as fast as any if well cared for. Mulch them well and they will grow. I have half an acre of English poplar that was put out four years ago; they have had no care except to mulch them, and they have grown very nicely; they are quite large trees and the cottonwood bugs does not trouble them as they do the cottonwood. I have elms and linden that are growing nicely; also tamaracks. They have made a nice growth this year.

FORESTRY IN SOUTHWESTERN MINNESOTA.

H. J. LUDLOW, WORTHINGTON.

When I came here in 1875, the planting of tree claims was the every-spring business of about one-half our farmers, and this paper will be my observations since then.

First, our soil is a black loam with clay subsoil, ranging from two feet deep on the knolls to six feet in the sags and swales; our elevation is 900 feet above St. Paul by railroad survey.

The first few years nearly every one planted cottonwoods, because they grew nicely from cuttings and when started good made a rapid growth; next came soft maple, then box elder and white ash with white willow for line fences. I will just say here that there ought to be a half-mile of white willow growing on every quarter-section, for it will furnish a farmer with all his fuel, besides making a good fence and windbreak; and if put upon low lands it is a rapid grower and just about as good as drain tile to dry out the land; but never try to grow crops in the shade of a row of white willows, nor plant an orchard nearer than 150 feet of it.

During the wet years cottonwoods did very finely where the fires were kept out of them, but the four years previous to 1892 were very dry here, and at least two-thirds of the cottonwood groves died. Where they stood alone or in single rows they are growing yet, but most of the oldest groves, where they averaged a foot in diameter and forty feet high, and were the pride of their owners, are now dead and being used for firewood. But the

few who put out white ash and black walnut are now happy, for groves of white ash which were put out on high rolling prairie seemed to make a better growth the dry seasons than they ever had before; and where the nuts of black walnuts were planted five years ago, just at the commencement of the dry seasons, the trees are now from two and one-half to three inches in diameter; and where they were planted fifteen years ago, they have been bearing nuts for ten years and are twelve inches in diameter. Every year increases the number of farmers who decide to have a black walnut grove, as well as a white ash; something that will not blow down, nor dry up.

Elm trees also are doing finely here after they get started. I saw some last year that made a growth by actual measurement of seven feet and two inches, and yet those same trees when three years old from the seed did not average more than knee high, which is the objection to them, for the average farmer will not keep trees clean three years, and the grass overruns them and he plants something else.

NATIONAL FORESTRY.

HON. ABBOTT KINNEY, LAMANDA PARK, CAL.

[The following paper was prepared for the late annual meeting of the Minnesota Forestry Association.]

National forestry is based upon two grounds: First, the advantage of maintaining forest production by the control of forests by an undying corporation, like the state. Under this head come the prevention of waste, the prevention of fire, the regulation of ripe timber cutting and provision for the reproduction of the most useful forest growths.

The forest management, with this object alone, would also have to arrange for the exploitation of all the resources of forest lands other than forest products themselves. These interests would comprise water developments, reservoirs, mines, quarries, game, fish, travelers for health or pleasure, and, in places, pasture. The object of regulating the last uses of forest lands would not be to curtail or vex them, but to prevent useless waste and destruction of the forests by carelessness and fire. The reason that national forest management is advantageous to secure a continued supply of lumber and other forest products, is that private or even state management cannot give a uniform system or a uniform protection, nor consider the forests from any better point than a narrow and purely individual or local one. Thus, in individual or state ownership a good system adjoining an indifferent or a bad one would be constantly subjected to the dangers of trespass, depredations and fire, growing out of the latter. So also a system in regard to some particular forest product, like tar, might be good policy, give returns and maintain product, if uniform and general, while it might and probably would be both costly and useless, if individual or local.

Besides this, a national system would necessarily consider the forest from a wide and general view as to locality, product and time. As to locality, a national system would consider, for instance, the interests of Dakota, Nebraska, Missouri, and all the states upon the water system heading in Dakota. An individual system would not consider such interests at all. A Dakota system would only consider Dakota, and pay no heed to

the other states. As to product—an individual system could only consider individual interests, a state system could only consider state interests. In neither case could national and general interests be provided for. As to time—the most important forest product, lumber, requires a long period of time to come to its highest economic value. One, two, and often three or more generations must be born and die before a forest comes to maturity. This fact makes it plain that no individual system can ever adequately provide for the reproduction of the most valuable timber, requiring scientific management covering many years of intelligent and watchful care. That this care pays handsomely we know fromthe returns of national forest management in Europe; but individual interests, especially in this country, even if capable of a uniform and broad policy can never be expected to expend care and money for rewards to be enjoyed only by generations yet unborn.

While the first ground for a national forest management is important, the second is essential. The second ground is based, first, on the demonstrated necessity for the maintenance of a certain forest area to secure the highest agricultural product from any given territory, and, second, on the demonstrated necessity for a certain forest covering on watersheds. The first case is due to the influence of forests on winds, frosts, climatic extremes and on their probable effect on the character and distribution, if not on the quantity of the rainfall. The second case is due to the influence of forests on the delivery of rainfall into springs and streams. As any watershed is forested so is the delivery of its rainfall affected. If it be adequately forested the rainfall will be detained and seep into the ground to appear in the springs and streams in a perennial and even delivery; if it be denuded and bare the delivery of the rainfall will be short in time and flood-like in character. The water courses in such districts always are of torrential character. The rainfall tends to become diluvial in character and its delivery is so in fact. The water delivery is alternately dangerous in its excess, in its detritus carrying and detritus dumping, and in its erosive power, while the sudden flood-flow of the rains precludes the possibility of a perennial supply; the water is gone and the stream bed is now a raging torrent, and now a dry and arid waste. Irrigation, domestic water and the value of streams for navigation are all diminished or destroyed by an undue denudation of watersheds.

Iteration has worn through the shell of prejudice and indifference, and reinforced by actual recent and recurring experience, has made California a community demanding immediate forest protection for its watershed. We favor the Paddock forest bill. At the same time we would have preferred our own bill introduced long years ago, which provided for the withdrawal of all government lands in forest, and for a system of management of the same. The Paddock bill is probably a more practicable measure. It provides for the management and care of forest reservations made and to be made. It consequently looks to a policy of initiation and growth and avoids the difficulty of creating suddenly a large forest force and changing all at once the entire neglect of and freedom from depredation and waste in the government forest lands. On the other hand, every day that passes reduces the government's forest holdings and increases the waste due to carelessness and fire. The situation reminds one

of the Roman legend of the sibylline books. Whatever defects the Paddock bill may have it is good, doubtless the best we can now expect, and should be heartily supported.

The work your Minnesota Forestry Association is doing deserves high commendation. I beg to express my appreciation of it.

DESTRUCTIVE AGENCIES ALIKE APPLICABLE TO MINNESOTA.

COL. E. T. ENSIGN, COLORADO SPRINGS, COL.

1. Fire.—In nearly all operations for the utilization of forest products a mass of combustible material is left behind, and then the careless use of fire in a dry period kindles a disastrous conflagration. All ordinary demands upon the forest, even with the wasteful methods in vogue, might be met if destruction by fire could be avoided.

2. Railway Construction.—Railway building in the Rocky Mountain region, especially in Colorado, is increasing in such rapid proportion as to offer a most serious menace to the existence of the forests. After the tie-chopping legion come settlers, miners, lumbermen, charcoal burners and others, all of whom in addition to the havoc wrought by themselves prepare the way for that most dreaded of all enemies, fire. The demand of the railways for cross-ties, timber and dimension lumber causes the most serious drain upon the forest. For ties, only the young, partly grown and most vigorous trees are used; the consumption for that purpose alone is enormous. The timber so obtained, as compared with other available material, is inferior in quality. Cedar and oak ties from the southern lake and Pacific forests can be delivered in Colorado at a cost not exceeding one-third more than the native pine ties; the former are in every way superior, and their period of usefulness is at least double that of the latter. Therefore, no hardship would be imposed in requiring railways to draw upon others than the mountain region for their timber supplies.

3. Lumbering.—The erection and operation of saw mills to supply local and ordinary demands for lumber would not be specially objectionable if the business could be conducted under proper regulations and restrictions. Under existing laws, however, most flagrant abuses are perpetrated, and the forests suffer great and unnecessary loss.

4. Mining Operations.—The requirements of the mining industries (including coal mining) are great and rapidly increasing. The timbering of mines, construction of shaft-houses, smelters, dwellings and other necessary buildings call for a liberal use of timber. In some of the older mining districts the timber supply has been exhausted, and such material is brought from a distance at undue cost to the consumer.

5. Charcoal Manufacture. — This, in certain localities, is a very destructive agency. The charcoal burner is as merciless as the hand of fate; he spares not the smallest and most insignificant forest growth, if nothing better is within his reach. The industry is fostered by the requirements of smelters, which consume great quantities of charcoal in the reduction of ores. The use of charcoal for this purpose is not imperative. Under certain processes charcoal is a cheaper fuel than mineral coal or coke. At some of the principal works but little, if any, charcoal is used.

DESTRUCTION OF THE FORESTS.

J. B. HARRISON, SECRETARY OF N. H. FOREST COMMISSIONERS.

All the forest lands in New Hampshire are private property, and the owners have the same right under our laws as the owners of any other property, to do as they please with their own possessions. The forestry commission has no more power of supervision, direction or control over the forests in this state than we have over the conditions of life on the moons of Mars. We can talk and write about the forests, the value of our scenery and all the rest of it, as we might about the little moons, and the sawmill holds its fateful course, just the same.

The people of the state can, of course, do nothing collectively for the preservation of our forests and scenery, except in a legal and constitutional way, that is, by legislative enactment. An act of the legislature would be required, establishing some method or system of administration and providing for the necessary supervision. But, while the forests remain private property, the state appears to have no power to exercise such control or supervision over them as would be adequate for their preservation. The state can enact laws for defence against forest fires, and if the people would enforce and obey them it would often have a good effect; but it would not save our scenery. The sawmill would still gnaw its relentless way up one side of every valley and down the other.

The individual owners can, of course, treat their wooded lands wisely, if they choose and know how. They could utilize in time the entire growth and produce of the forests without destroying or impairing forest conditions, but apparently they, in general, neither choose to nor know how. To bring about such conditions of general enlightenment and co-operation as would lead to the preservation of the forests by the action and management of the individual owners, is practically impossible. We cannot command the means and conditions which would be necessary for such educational work. It appears to me that the only plan by which we can reasonably hope to accomplish anything vital for the preservation of our forests and scenery is that of state ownership of our mountain lands. Any considerable or adequate interference by the state with the management of forests which are private property is out of the question. There is no provision in our system of government for anything of the kind, and no disposition on the part of the people to attempt the introduction of anything so foreign to our usages. So far as I can see or judge, it is certain that while our mountain forests remain private property nothing effective will be done for their preservation or for their rational management.

The White Mountain forests are more valuable as scenery, as the indispensable enviroment and theatre of our summer resort business, than for the production of lumber, and in all our thought of these matters the lumber interest should be subordinated to the scenery interest. But there is no necessary antagonism between the two interests when they are intelligently managed. Until 1867 the state owned vast tracts of forests in the regions which are now being desolated. The transaction by which these lands were transferred to private ownership was wholly indefensible, if not inexplicable. The price paid for them was palpably nominal and unreal. I think the people of New Hampshire should now resume possession of these lands by the exercise of the right of eminent

domain, with just compensation to those who now hold the title. The cost to the state should not be very great, when all the facts in the case are considered.

Our principal difficulties and obstacles are psychological; that is, they are in the thought and feeling, habits and character of our people. We are going on in the old paths because we have always followed them, and it is easier to go on thus than to change our course. We do not readily adapt ourselves to new conditions or even recognize their existence. We are busy with our individual affairs and interests; and we are not thinking much about any effect on the prosperity of the state, or even on the welfare of our own children. There is not much popular interest in the value of our forest and scenery. Even those of us who have our money invested in mountain hotels and boarding houses and in the factories using water power from the mountain streams, are mostly apathetic, while the sawmill steadily cuts the ground from under our feet. We are inclined to rest content with the comfortable reflection that "things will last out our time," and to leave this problem, with many others, to our children. We need the aid of the press of the country in awakening public attention to the destruction of our scenery and water sources, and the consequent impoverishment of the people of the state. I shall be glad to receive suggestions from any source, and they will be carefully considered by our commission.

N. B. (Read the above with care, and apply it to Minnesota. We of the far west are coming into the same leaky boat as New Hampshire and other eastern states. The determination of the greed mongers is to so fix God's bounties to his children, that no man can have anything by and by outside of the individualistic and monopolistic ring.) Secy. Minn. Forestry Association.

SOUTH DAKOTA FORESTRY.

J. C. JONES, WATERTOWN, S. D.

I had looked forward with a great deal of pleasure to the 1893 meeting of the Minnesota Horticultural Society, especially such sessions as might be devoted to forestry. I had fully intended being present, but matters beyond setting aside prevent.

I desire to say at the outset, that I am no scientist, am not posted in any way in forestry matters, but am an enthusiast and yield to no human being in my love and appreciation of trees.

During my residence in South Dakota of fourteen years I have seen and felt the necessity of groves and shelter belts. The second year after coming to the state (then a territory), I planted in the untamed soil a lot of box elders, cottonwoods and willows, likewise some small fruits. Before I left the claim a miniature grove had sprung up—thanks to my watchful care, but one day a passing locomotive kindly fired the prairie, and my pretty little grove was destroyed.

When I took up my residence in Sioux Falls, I planted out some trees around my first home with excellent success. Selling that home and buying another, again my love for the beautiful dominated, and more trees were planted. Business interests calling me to Watertown, compelled me to give up my Sioux Falls residence. History repeated itself and my

work was destroyed, the tenant using the grounds around the residence for pasturage purposes, the trees, of course, suffering. In a fit of despair the place was sold at a sacrifice.

But it is during the last year or two that I have become an enthusiast, rivalling in my enthusiasm even that of the crusaders. They had a purpose, so have I. It is to aid both by voice and pen to the best of my ability the planting of trees on our bleak prairies. Here in Watertown, with at present only limited ground-room, I have planted trees and shrubs in goodly number. While knowing nothing scientific, fair success attends my efforts. The trees are watched; if a worm makes its appearance, it is quickly ushered out of existence; if there is anything I don't understand, I write and find out if a possible thing. Of course, watchful care is given everything growing under my supervision and habits studied as time affords. Mr. J. O. Barrett, the secretary of Minnesota Forestry Association, is responsible to a large extent for the zeal I display in forestry matters.

Almost the first thing I ask a new farmer acquaintance is, "Have you any trees on your farm?" If he says "no," my heart sinks. He is urged to plant. If no interest is shown by him, if he is careless or says, "I don't care for trees, they are too much trouble and cost more than they are worth," or if he says, "I have planted trees but they won't grow," I feel ugly and ask myself, "why is it that such are allowed to share in the benefits this prairie affords?" I can't believe this state of ours was intended to be left treeless. In my opinion it was the intention of the great Gardener that we should make of it a wonderland, which we can with perseverance, intelligence and energy. The soil is here, subdue it we must; but thousands of acres in prime condition for tree planting are yearly plowed by men too stingy or too lazy to indulge in the pleasures of making a home in the truest sense of the term. Winds sweep across our prairies, in the summer hot and blighting at times, in the winter they chill one to the marrow. It is in our power to say to the winds (except when they come in their resistless fury, which is rare indeed), "peace, be still."

Groves and shelter belts will do the work. Trees planted as they should be in sufficient numbers will give our state a new and improved appearance and will put wealth into the pockets of their owners. Our state can be made beautiful beyond the power of pen to describe or brush portray. Suppose each brook or creek was bordered with trees, would not the waters sing more merrily? Would not their laughter be sweeter for it? As the waters of the creeks joyously rush to form more noble streams, would it not be an inspiration for us to do more? Let the careless dweller in South Dakota picture to himself the rivers of our state, skirted with generous plantings of timber, forming ribbons of silver as they find their way into the fickle Missouri. Take our lakes, surround them with timber; what a change there would be, each lake a jewel beyond price in settings of choicest emerald; the waters flashing back to the caressing sun their thankfulness, would well repay any efforts expended. Trees would help our streams—of that we are certain—and shelter us from the winds, with equal certainty. We are told forests are great protections against hail storms. There are other benefits, also.

There have been many failures among tree planters in our state, and I am inclined to believe it is to a certain extent because we have not planted the right sorts. The Russian poplar and willows are highly

spoken of; cottonwoods seem to die, perhaps from an unsatisfied, inordinate thirst; box elder and soft maple are not, in my opinion, just what we want for shelter belts. But I am not going to attempt to give any advice, that must be left for wiser if not older heads. In closing my rather uninteresting paper, permit me to say that I hope the work of the Minnesota Horticultural Society and the Minnesota Forestry Association will be pushed, and that through them we of South Dakota may gain large chunks of wisdom, and have our souls filled with a longing for and a determination to secure a fair proportion of what we so much need —trees.

THE GERMAN SYSTEM OF FORESTRY.

E. MEYER, ST. PETER, MINN.

I am very sorry that my health prevents me from traveling in the winter, and, therefore, cannot be with you at your interesting meeting, but I cannot let it pass without saying a few words to help and encourage our cause. I was once, many years ago, a forester in a country where forestry is a science, where schools and colleges are established for the special purpose of educating young men in the science of forestry and all the natural sciences pertaining to it; where these students have to pass severe examinations before they can be entrusted with the care and management of a forest. If any one of the members of this association has traveled in Ger many, and not merely gone there to see the big cities but visited the country, he must have noticed the fine forests scattered all over the country in every part of the empire, which, by the care and will of the forester, have been in many instances brought to a point of perfection. The magnificent beech forests there are an ornament to the empire, and cannot be found to such an extent in any other country. If you go among these beautiful trees with their white smooth bark, you will find the ground as clean as a floor. There are no underbrush, weeds or grass to be found, neither dry sticks, the cleaning of the trees being always picked up by the poorer class of people and carried to their homes.

Germany has been very fortunate, more so than any other country in Europe, in having preserved a large part of the original forests which covered the whole country at the time of the first settlements by the German tribes, dating back several centuries before Christ. In regard to this timber there has always been the idea more or less prevailing among the German people that, having received these forests from their forefathers, they had no right to appropriate the same for selfish purposes, to waste or destroy them for one cause or another, but that this inheritance was to be considered a capital, the same as a loan of money of which they might use the interest but were in duty bound to hand over the principal in the same or better condition to their next generation; and, in this way, many forests have through hundreds of years descended to the present generation. What I mean by the interest which a forest yields, is the yearly growth, demonstrated in the number of cubic feet, which amount, in a regulated forest where within the lines of each piece of timber the trees are all of one age, can easily be ascertained by an educated forester; said amount serving considerably as a guide in his forest operations.

I just happen to remember an incident of history told about one of their great emperors of the middle age, Frederic Barbarossa, or "Blue Beard,' who went to Italy on a war expedition. After an absence of three years, finding on his return a large forest rubbed out and turned into farming land, and in a locality where, according to his judgment, the timber should have remained for the general benefit of the people, he became very much enraged, punished severely the perpetrators, who were persons of high-rank, and ordered the forests to be replanted, which can be found there to day. This occurred in the year 1150, A. D.

And now in the 19th century, after many hundred years of progress in civilization, science and increase of general knowledge, I ask, what are we doing with our forests in this glorious country, where we are told in every 4th of July speech, that it is the best government in the world? Supposing the old Emperor "Blue Beard" should come back here now. In imagination we will let him rule over us in his despotic way. Looking after his new empire we see him coming up here to inspect the famous pine forests of Minnesota, taking the road that leads through the pineries to the great city of Duluth. Looking out on both sides of the road for the beautiful trees that never appear, and then discovering nothing but pine stumps, burnt poles and poplar brush, would not there be a terrible reckoning up with the parties that are responsible for this frivolous and unpardonable treatment of our forests? I passed over that country myself some time ago, and must say that I was ashamed to live under a government that would allow such an outrageous work to go on.

There are millions in this country who never think of or pay any attention to this all-important subject of forestry. A question was put to me yesterday in conversation with a man of high education: "Why in common sense," he asked, "do not the people or their rulers break up those millions of acres of woodland, and make farms there on which they can raise wheat, corn and potatoes to feed the poor, instead of letting them lie wild as dead property, bringing in nothing, just for some rich man to enjoy the pleasure of hunting?", and he added, "I cannot help thinking that the people there are ignorant and foolish to allow those lands to remain unoccupied," Such silly remarks coming from a prominent business man, above the average man in education, are very discouraging to our noble effort. As just such kind of men compose our legislature, I can see the difficulties before us. With the hope that we will win at last and have a forest reserve Germanized in management, and my best wishes for all the members of our association, I remain, yours truly.

ADDRESS ON FORESTRY.

PROF. B. E. FERNOW, CHIEF OF FORESTRY, WASHINGTON, D. C.

Mr. President, ladies and gentlemen:—I believe it was Miss Frances E. Willard, the celebrated temperance orator, who was once twitted upon her efforts, that they did not seem to lead to any results. But she coolly answered that she was in the same condition as the farmer working the churn—it was necessary to agitate and agitate, and finally the butter would come. (Laughter.) And so we are here again to churn and agitate in the hope of producing some butter. I confess I am afraid we have been agitating a long time without having succeeded in producing much in

in forestry reform, and I propose to-night to open up the tub and look into it, and see what the condition of the cream may be, if there is any cream. Perhaps there is only milk in it, and all our churning will come to nothing, but we want at least to see what hopes there are of getting butter. One objection I have to turning the crank any longer is that we do not seem to get at those men who ought to be made to turn the crank, namely, the lumbermen. At all the meetings at which I am usually called upon to talk upon this subject they are absent, these very men who ought to be most interested in this subject, and who ought to be put into the tub and churned or placed at the crank to do the churning. (Laughter and applause.)

Perhaps, it would be more appropriate in speaking before a horticultural society to choose as a subject some phase of forestry that has more connection with horticultural pursuits, but I choose in preference another phase of the forestry movement which I believe at the present time to be of very much more importance than the one in which your society has been so successfully engaged, since Mr. Leonard B. Hodges gave life to the question of timber-planting in Minnesota and pushed it with so much zeal. This other question concerns the existing forest resources and a proper policy regarding them, which can be instituted only through associated effort.

I address you, therefore, not as horticulturists, but rather as associated citizens, as a society which has an interest not only in horticultural pursuits and the raising of fruit trees and fruits, but also in the advancement and development of all cultural conditions—and one of those cultural conditions is a properly managed forest area—a society which may be active in bringing about reform in the care and utilization of forest resources and forest conditions.

I wish to call your attention to my use of the words, forest conditions and forest resources. They are not used for oratorical effect, but for a distinct and very significant purpose. As far as the forest produces material it is a forest resource, but the forest is also a condition of the soil which exerts peculiar influences upon our climatic and other cultural conditions. Both forest resource and forest conditions are most important and essential features of our civilization; both are endangered on account of the carelessness, ignorance and greed of men, and to change the attitude of our people towards these two factors of our prosperity is the object of the so-called forestry movement. So far the forestry reformers have not been very successful.

The policy that existed ten years ago, when the American Forestry Congress was first called to order in 1882, was to slash the virgin timber, to allow fires to destroy what was left, to let the denuded areas grow up to useless brush, and to turn them into waste barrens without any regard as to what the future would make of the land, or what would be the future of our lumber industry. The lumbermen of to-day are doing the same thing that they did ten years ago; there is no change noticeable in their methods. Now and then at the mill there is some regard paid to getting more lumber out of the logs, but taking it all over the country the methods of lumbering and the methods of treating the forest areas after they are logged remain the same as they were ten years ago, with but very little, if any, change.

What is the reason that we have made so little progress in our attempts at reform? Why should this important subject not have found more attention, and why is there not more effort in bringing it to an issue? There are many reasons for it. The first reason is that the men who are engaged in bringing about this reform have been and often still are at fault. There are many of them who are simply enthusiasts without sufficient practical knowledge of the subject. They are indignant at seeing the havoc and destruction that is wrought by improper practices of the lumbermen, and all they do is to denounce the lumbermen, instead of suggesting to them practical methods of overcoming the difficulty. Now these friends ought to understand that the lumbermen are not alone to blame and that their case has some reasonable background. These same enthusiasts have talked about forest influence on climate and waterflow in a loose way. As to the existence of that influence there can be no doubt, but as to exactly how far that influence is felt and in what directions it is all powerful, there are a great many varying opinions, all based upon good reasons. Therefore, we must not generalize on this matter too fast. Whenever there was a flooding of the country, our enthusiasts urged that the destruction of the forests is the cause. That is not necessarily so. Very likely, nay, assuredly, there is some such influence upon waterflow exerted by the forest areas, which tends to lessen the dangers of floods, but there are many floods that would occur, forest or no forest.

So I say our forestry friends are to be blamed somewhat for representing things not in their true light, and for not addressing themselves to those men who ought to be most interested in the subject, the lumbermen, with arguments and demonstrations of the advantage to be derived from changed methods.

Forestry statistics are among the most difficult to get, as every lumberman who has timber-lookers under him very well knows. Even the timber-looker, who makes it his business to go out and determine how much wood there is per acre, will often make a mistake of fifty to one hundred per cent one way or the other. If that is the case when referring to small areas, how much more difficult is it to get an answer to a question as to the forest resources of the United States, as to the supply compared with the consumption. The lumbermen say we have more timber than we need, that our timber resources are inexhaustible; that is, they used to say it. There are a good many lumbermen now who will agree with me, that, as far as the supply of one kind of lumber at least is concerned, the white pine, we begin to see the end. Not necessarily within ten or twenty-five years, because that depends upon many contingencies which nobody can foretell—the substitution of other woods for white pine, and therefore less consumption; the substitution of iron, which will lessen the consumption, etc. But comparing our present consumption of white pine with the areas we have, it will be but a few years comparatively before we reach the end.

Some of you perhaps do not know that it takes from one hundred to two hundred years to grow those fine trees which we cut every day; in fact, we are cutting mostly trees that are older. In the South any pine that is below two hundred years of age was until lately not considered worth bringing to the saw-mill; it was not worth the cutting.

Speaking of our total supply and demand of forest material, as near as I can figure it the situation in regard to the lumber supply is about this: The amount of wood of all sorts and shapes, for lumber in the arts and buildings, railroad building, fence material, for fuel—which is the largest requirement for wood in the United States, curious as it may appear to those who use coal—amounts to from twenty to twenty-five billion cubic feet per year. It is an almost inconceivable quantity, and it is almost ten times as much as any other nation uses. Our whole civilization, in fact, rests upon our lumber, and, therefore, it is an important subject to look after.

In addition, we burn up wantonly many million cubic feet in our yearly conflagrations. According to a canvass which I made several years ago, we have a forest area of less than five hundred million acres. Now, we know from the experience of other nations, and especially Germany and France, how much wood can be grown per acre per year under good management. These nations treat their woodlands like a crop; as you know how many bushels of oats per acre you can grow, or of wheat or of corn, or at least a certain range within which your crops move, so they know what their wood crop is likely to be under given conditions. We know from them that fifty cubic feet per acre per year is a good average crop of wood over a large country and if we apply this figure to the acreage of the United States we find that we are now using just twice as much wood material as can possibly grow on the acreage we have under wood. We are now, to be sure, using the wood that has grown up for centuries before—our surplus, our capital—but we use twice as much as our interest, our yearly growth. That is the position we are in regarding our forest resources.

Regarding our forest conditions, I think those of you who have travelled will bear me out in the statement that in many parts of the country, along all the railroads almost, they are in a deplorable condition. Whole mountain sides are being burned over in the West. They do not count fires there by acres but by square miles, and a thousand square miles, more or less, a year is a matter about which nobody has much concern I tried to ascertain the loss by fires the last year, a very unsatisfactory piece of statistical work, and found that the small percentage of which reports could be obtained represented a loss of at least twenty-five million dollars during that period. The presumption is that these figures may be easily doubled in actual value of timber. To this we must add the loss—in prospective value—which the destruction by forest fires always brings with it. It is very difficult to ascertain such facts as we need to present, and we must refer to this difficulty as an excuse for the failure of our forestry friends, who are forced to make general statements which they cannot bear out by specific facts.

Another difficulty they meet is one that all educational effort brings with it. You know how long it takes to get an education. While it is difficult to get an education for our children and ourselves, it is much more difficult to educate a nation. Now, as a nation we have been educated to wastefulness. Our pioneer life here, the hewing out of our civilization from the woods, has created a feeling that timber is an obstruction, is not worth anything only to be removed, no matter what the consequence is. To eradicate this sentiment, which is quite natural, and to inculcate a new spirit, which will teach our people to look upon our

forest resources just as we look upon our agricultural resources, as something that ought to be kept in good producing condition, takes time. To be sure, there has been some progress made in the sentiment of the people, and it is growing; there are more people interested in the subject to-day than ever, who see that there ought to be something done in conservative use of our forest resource and in care of our forest conditions.

Another difficulty in our path is that, on one side we have personal interests, the personal pocket interest of the lumbermen, and on the other side we have only the community interests, the ones which seem always to lag a little behind. Selfish interests find ready means to accomplish their end, while communal interests suffer. We will have to struggle in that direction and endeavor to establish a more general interest in communities regarding the conditions that surround them.

The people of this state should look around them and see what this policy of neglect leads to. You Minnesotans should look over the country between Brainerd and Gull Lake, and see what the result is of the methods that are now being pursued in your states, in the use of the forest cover. You should see what becomes of the country that is denuded in the manner in which it is now done, and then you will wake up to your citizen's duty and consider what can be done to prevent a large area of your commonwealth from being converted into the same uncivilized, useless condition.

Now I come to the main difficulty in forestry reform, which is one we can hardly control, and which lies in the peculiar economic conditions under which we live. We have an enormous country with enormous resources, with three times as much land to raise crops as any of the European nations. I wonder whether you have ever realized that the difference social, political and economical between Europe and the United States, resolves itself into a difference of density of population? While each one of us has fifteen acres in cultivation to draw upon, in Germany there are but two and two-thirds acres of field and forest and brush and waste land, all told, to one person. That is to say, we have seven times as much to draw from as the Germans have, with plenty to spare when we need it. Our population is very scanty, comparatively speaking, and this is one reason why it is so difficult for us to progress in our forestry reform. The population is not dense enough to make a close utilization of the wood material possible, or its necessity apparent; it is not dense enough to render protection against the spread of fire readily attainable and in the absence of a dense and evenly distributed population virgin timber lands are opened to markets in regions where even the men to cut the timber have to be brought from a distance. The transportation to market costs so much that it pays only to take the best timber, necessitating the wasteful manner of using the forest, and after the cream is taken the balance is left without any attention to the future of the property, there being still large areas of virgin land left to draw from. This policy the lumbermen in many regions are bound to follow for the reason that, like other men, they carry on their business for their profit.

Now, the question is whether they can change their method and yet make the business profitable; whether they can spend money on superintendents who can direct more rational cutting; whether they can afford to spend money on keeping out fires and taking care of the

property after they have culled the timber. In many instances it is very questionable whether that could be done. Of course, these men want the dollar and they want it now. They do not care for the dollar a hundred years hence, and, as I have stated before, it will take a hundred years to grow a white pine tree that will be fit for lumber.

Therefore, the man who now begins to plant and preserve white pine will have to wait for his money return a hundred years. That is not a matter of interest to the lumbermen, but *it is* a matter of interest to the community, for the community has an interest in the future condition of our forest areas. While it may not be expected from the lumbermen that they will curtail their present profits for the benefit of the future community, we can in some degree make common cause. Perhaps, we can help the lumbermen to make their business more profitable and at the same time guard the interests of the community in forest conditions: and this is a point that I want you as an association especially to take to heart—that it is for you to interest the lumbermen of your state in this subject. They are the owners mostly of this forest property and have the right to do with it what they please, as far as its utilization goes, yet you as citizens have an interest in seeing that their mismanagement does not reflect disastrously upon other conditions, and you ought to interefere, but only indirectly, by making it possible for the lumbermen to transact their business better, and also by showing them how they can do it as profitably while doing it better.

Now, the greatest trouble we have arises from forest fires. Until we can get rid of this scourge, there is no use of talking of better methods of lumbering. You may carry on lumbering operations as carefully as you please, yet when fire gets into the camp again and is not checked, it is bound sooner or later to make a waste of the forest, preventing useful reproduction. Therefore, the first care we should take is to find means to prevent the spread of fires. As I stated, the loss by fire of logged timber and other property—valuable property—amounts to between twenty-five and fifty million dollars per year Is it not worth while to spend a few million dollars to prevent this annual loss? I believe it would be. Now the question has been often discussed and everybody has agreed that this is a thing that ought to be done. Can it be done? We have the example of the state of Maine and the province of Ontario, of successful beginnings in this direction. The Maine law was enacted in 1891 and has been in operation for one year very satisfactorily. The fire commissioner now reports the results and also the necessary amendments to the law. There is one feature that is most necessary in fire legislation, namely, to provide the machinery for the enforcement of the law. We have more laws on the statute book that are not obeyed than we have laws that are in force.

This was, at least to some extent, recognized in the Maine law, and a responsible officer, whose duty it is to organize a service and enforce the regulations of the law, is one of its best features. In addition to that law of the state of Maine, we might take a lesson from the Canadians in the province of Ontario. Upon the advice of the American Forestry Association some years ago, while holding a session in Montreal, they enacted a fire law by which the government employed fire patrols during the dangerous season, the men being recommended for the position by the lumbermen, the lumbermen paying one-half of the expense and the govern-

ment the other half. This plan, I am informed, has worked admirably for the last two or three years, and the lumbermen have urged the government to increase the number of fire patrols. This is a feature which you should also include in your forestry laws. If you can devise practicable and effective forest fire legislation you will have the lumbermen on your side. That is the beginning of forestry—to stop destruction, and not to stop lumber cutting. If nothing more were done than to stop the unnecessary waste, it would be sufficient for the present.

Now I wish to speak about the general government. I think, of all the foolish, unbusiness-like methods in which our government abounds, there are none that will compare with the management of the public timber land. These lands represented one of the most valuable of public properties, but they have dwindled away until now there is only a small part left, and this part is being robbed right and left; and the government has never had any equivalent for the value destroyed. This is your timber land and you are the owners that are being robbed by lack of proper legislation. To get rid of the timber, to let it be stolen or be burned up, has been the policy. Within the last two years we have been successful—and that is, perhaps, the only success that the forestry people can boast of—in changing this policy, by the introduction of a clause in a bad law—this clause is the good part—allowing the president to reserve public timber-lands for forest reservations whenever he sees fit. This law will stand in the history of the United States as one of the wisest laws ever made regarding economic legislation.

Most of the forest property of the United States lies west of the Rocky Mountains, where in order to carry on agriculture it is necessary to have irrigating ditches, and the people there have begun to wake up to the fact that the forest is a storehouse for water that is better than any artificial one they can construct. Therefore, this law was enacted, in addition to all other irrigation laws, to help the farming interests of the West. Under this law, the president has made now some thirteen reservations in various parts of the country, comprising all together some eleven million acres of land. In addition to that, there are various national parks, as you know, and to those there have been others added. In addition to that, you have now in this state a donation of forty thousand acres to the state of Minnesota by the United States, the Itasca Park, which was ceded to you for park purposes.

Now, I want to have you keep in mind that these parks are not what the Forestry Association is after. These parks are not the same thing as the forest reservations we are asking for. They are something entirely different, and the people in Minnesota have been mixing up these two things, greatly to the detriment of both. A park is set aside for the purpose of preserving the scenery and the natural objects of interest, the game and fish and other things, for the recreation of tourists or visitors, or for health-giving conditions or purposes of similar nature. The forest reservations have an entire different object in view. They are to be made for the purpose of utilizing the timber and any other resources in the same in a rational manner, instead of the irrational use to which these lands at present are subjected. If it were only known to the people in your state, that when we ask in Minnesota for a reserve of five million acres in the northern part of the state for forest purposes

it is not the intention to withdraw this land from use, but, on the contrary, it is to insure and regulate its rational use, I am sure that the request would be favored by all well-disposed citizens.

The object of these reservations is to devote such land as is fit only for timber growth to timber growth, and whatever land is fitted for agriculture is to be open for agricultural use. The minerals that are on such reservations are to be mined under regulations, and the timber is to be cut under regulations, such as have been embodied in the bill known as the Paddock Bill, introduced in the Senate, in which the methods and management for these reserves are outlined. Under this bill a settler by paying a nominal license fee can supply himself with the timber he wants, and a prospector by paying a nominal fee can supply his wants under regulations. A lumberman can supply himself with the stumpage, not in the illegal way in which it is now done, but in a perfectly straightforward, legal manner; not in a small way either, because it permits him to enter the stumpage of twenty-five sections of land, that will make it worth his while to put up a sawmill, by paying a small license and stumpage fee, such as may be determined upon by bids in open market or otherwise. With such a beginning the gradual development of proper, more refined forestry management would be assured.

These then are the two directions in which associated effort is needed by those who recognize the necessity of a change in our forest policy: First.—For the states to secure reasonable protection of forest property against destruction by fire. Secondly.—For the general government to establish the policy of reserving all remaining public timber lands and placing them under proper administration.

Let the churning be done, the butter must come finally!

DISCUSSION ON PROF. FERNOW'S ADDRESS.

Mr. C. L. Smith: I think that what Prof. Fernow has said should prove of great value to us here. We who have had to do with this matter have always come across a snag before we got very far, and it has been one we could not get around. When we tried to pass certain legislation in the interests of the people of this state we were opposed by many who supposed they ought to be opposed to any legislation in this direction, and they were backed up by a personal interest with plenty of money. Fourteen years ago a law was passed in this state against the setting of fires, providing penalties for so doing, providing for the appointment and salary of an officer to execute that law. That salary has been paid for the last four teen years, and the man who drew it has been a clerk in the State Auditor's office. There has never been a man punished under that law in the state of Minnesota. Now, what we need is education. We have made some progress during the last two years, and there is a greater interest taken in this matter now than there was in the past.

As the professor said, our lumbermen are not with us to-night. These men, many of them, have grown rich off of these lands, and have their millions to spend, if they wish, for philanthropic purposes, yet they are not here to-night to take any part in this movement, or to help to restore to the general public a part, at least, of what has been taken from the general public. The lesson has been learned by experience in other localities, and some of us have learned it here, but the general public still seem to misunderstand these matters. We need to discriminate between the "National Park" and the "National Forest Reserve." Now, I have looked up this Maine law, and I think it is a good one. One of the best provisions of it is that it provides for the salary of a fire guard, and provides for the punishment of that fire guard if he neglects to do his duty. We have suffered terribly from fire in this state. Millions of our pine trees have been destroyed in a single night. I believe that the destruction of timber from forest fires in Minnesota every year amounts to more than all the timber cut by the lumbermen, and I believe that a one-hundredth part of the cash value of the timber destroyed by fire in Minnesota every year, if properly expended in fire protection, would save that timber. If we can convince a few of the leading lumbermen that there are a few dollars to be saved by doing that, then I think we shall accomplish our purpose.

Secretary Barrett: I always like to hear Mr. Smith talk, as he talks right to the point and hits the nail upon the head. I fear, however, that the idea might have been conveyed by the general tenor of his remarks that the lumbermen did not care anything particularly about forest fires. I do not suppose Mr. Smith means that. I have had occasion to talk with a large number of lumbermen, and also with cruisers who go out over the country to ascertain the best places for lumbering, and so on, and I have found that to a man they are deeply interested in the suppression and prevention of forest fires, if it is possible to suppress them. They do not see the practicability of the thing, however, and they do not understand how it can be done. Now, the general impression seems to be, that the lumbermen are responsible for the forest fires. This is not the case. There are more fires spread by the hunters and poachers than by any other class in the woods.

The sparks from the railroad trains sometimes do set fire to the woodlands. In conversation with some of the leading directors and managers of different railway companies, I learned that it is the rule with our railroad companies in Minnesota to have the fire arresters—the machinery that arrests the fires—always ready so as to forestall as much as possible the fires in the woodlands. They also use coal, and I learned that they used it largely because it was less liable to set fire to the forests.

Well, when I spoke with these different lumbermen, they listened to my views of the situation, and when I told them what could be done, they seemed to be surprised. They were not aware that any such a movement was on foot. The competition is so severe that they are obliged to calculate very finely, and they have not any time to consider this question. In the meantime, our forests are going with incalculable rapidity, as Prof. Fernow has shown. I think our hope is that we shall be able to enlist the lumbermen on our side. I think, still further, that the lumbermen will work heart and soul for anything that they think is practicable in this direction. I know by experience that they are all good fellows, courteous and wide awake, and interested in public affairs and improvements, and I believe that if we exhibit the spirit that now animates the friends of forestry, that from the start we will win the co-operation of the lumbermen. (Applause.) Our representative in the farmers' institute is present, and he teaches forestry. I hope he will say a word or two.

Mr. William Somerville: I do not wish to do too much talking, but this is something I am much interested in. Wherever I lecture upon horticulture, I have forestry as one of my topics. I want to make this an individual enterprise, believing we can spread it through the country quicker that way than any other. When I came to Minnesota there was not wood enough in the township I lived in to get dinner for the people who are now in the town a half-dozen times. We went to work and kept the fire out, and we have now a thousand cords of wood where there was not an armload thirteen years ago. (Applause.) I want to get the people of this state to set out evergreens. I mean our evergreen trees. I was the first one to set out evergreens in that part of the country, and I have kept an evergreen nursery, and make a business of almost giving them away to the people, so there is scarcely a farm in the neighborhood

that has not a pretty good windbreak. Now, in my lectures, I tell the people how to grow them, so they will have a protection for their stock and buildings and beautify their homes. I do not wish to occupy your time, and will therefore say no more on the subject.

Mr. Smith: I think it would be proper that we should return to Prof. Fernow the thanks of the Minnesota State Horticultural Society and the State Forestry Association, for his able address delivered to us this evening. I make that as a motion.

Motion carried unanmiously.

Mr. Alfred Terry: I do not believe it ought to appear upon the records of the society that evergreens are the only trees to be planted in the state, and not have anything said about the incalculable value of the deciduous trees.

Mr. Somerville: I did not mean that you should think for a single moment I was opposed to those trees. However, we prefer the evergreen for its beauty and ornamental purposes, and one of them will give more shade and break the wind better than half a dozen common trees, as Mr. Harris knows.

Prof. Fernow: I certainly did not wish to be considered as discouraging anybody's tree planting, but I would discourage the planting of too many trees, because they are a discouragement in the end. I want to encourage the planting of evergreen trees on the prairies, for the reason that no other trees will stand the climatic changes as well as the evergreens. They are the most difficult to start, but when started they are started forever, while your deciduous trees will die of summer or winter drouths in these western countries, when they are ten or twelve or fifteen years old.

President Underwood: Professor, what deciduous trees will stand the drouth the best?

Prof. Fernow: I have a fund from the Prussian government for the purpose of securing them some American trees. They asked me to suggest what they might experiment with that they did not already have, and I proposed the green ash and the bull pine for drouthy situations. They replied they had tried both and could not use either. (Laughter.) You are well aware that the green ash is the only tree that will stand the dry condition that exists here. The bull pine grows in the very driest situations we can imagine, next to the cedar, but in Germany it would not do. It is very difficult to speak of such thing in a general way. I believe the most profitable

of the deciduous trees to grow is the locust. The black locust seems to have succeeded in more exposed places than any I have seen.

Mr. Smith: Generally the black locust has failed throughout the state.

Prof. Fernow: Well, that is why I said it was difficult to make a general statement. There are certain things not yet understood, and one of them is the acclimation of trees.

Mr. Smith: My observation in traveling over the country has been that the box elder has stood where everything else has failed. I sent four hundred letters to correspondents in this state and Dakota, and I received back three hundred and sixteen answers, two hundred and forty of them giving the box elder as the tree that had done the best with them.

Mr. Somerville: I will tell you my experience with Mr. Hodges in 1873, 1874 and 1875. I was with him when he was setting out timber for the Northern Pacific railroad. He set over half a million evergreens of different kinds. We set out the Norway spruce, the white spruce, arbor vitae, Scotch pine —about equal numbers of each kind. They were all cultivated and all set about the same time and in the same manner. Two years ago this summer I was out to Willmar, Benson, Morris, Kandiyohi, and along that line of road; I found that wherever we had set a Scotch pine, it is there yet and is a fine tree, and wherever we set a Norway spruce, it is gone. There are a very few of the arbor vitae, but our Scotch pine appears to be all right and in as good shape as when we set them. That proves to me conclusively that the Scotch pine will stand more drouth than any other evergreen we have, and will live where almost any of the deciduous trees will starve to death for want of water.

Mr. O. F. Brand: Did you plant the European larch?

Mr. Somerville: Yes, and a good many of them have lived and done very well, likewise. I helped to plant those groves around Willmar, Morris, Benson, and through there. I was with Mr. Hodges during all of that time.

President Underwood; Do you know anything about the Balm of Gilead tree?

Mr. Somerville: We set out some of those, but they did not do. We also planted groves of oak timber, of jack oak, and white and bur oak, and those groves grew up, and are fine trees to-day. Some of them are large enough for fence posts.

Judge Moyer: How about the white spruce?

Mr. Somerville: Some of them are living. They do better than the Norway, but none are as good as the Scotch pine. I have some of the jack pine at home, but have never tried them away from my farm. I think they are about the same as the Scotch pine.

Prof. Fernow: I was going to speak of the jack pine as a native. I have not recommended the Scotch pine, because it is a foreigner.

Mr. Barrett: Would you recommend the jack pine for a windbreak in this latitude?

Prof. Fernow: I have given hardly any thought to this tree in connection with windbreaks. In fact, I do not consider windbreaks exactly in the realm of forestry. I think I should prefer a spruce, because of its lower branches.

Judge Moyer: I would like to ask Mr. Somerville if many of those spruce trees he planted on that line of railroad were not black spruce?

Mr. Somerville: I do not think we got any black spruce. The dry weather was too much for the spruces generally. Of course, I would not set out a Scotch pine where I could get a white spruce to grow, because the white spruce will retain its foliage to the ground, while the Scotch pine will shed its under limbs as it grows, and you have a tree only at the top.

Mr. Patten: Was the red pine tried in the experiment?

Mr. Somerville: I don't think it was.

President Underwood: Is it not true that the Austrian pine generally sunburns so you cannot do anything with it?

Mr. Harris: I do not think it has been tried enough to say that is the case. I do not think it is as hardy as the Scotch pine, because I have seen trees that sunburn in the winter. That is to say, the frost and sun in the winter hurt them.

Mr. Wedge: I would like to ask Prof. Fernow about the variety of Scotch pine called the Riga.

Prof. Fernow: That is simply the pine grown in Riga. It is exactly the same in every other respect.

Judge Moyer: The only spruce that is doing anything in our part of the state, is the white spruce. The only pines that are growing there are the Scotch pine, pinus sylvestris and the dwarf mountain pine that came from the top of the Alps. That pine is doing first-rate in western Minnesota.

Mr. Smith: Out in the dry mountains of Montana, I have seen the red cedar growing very thriftily. I had the privilege of stopping the other night with a farmer who had a grove of

red cedars around his house. The trees were pulled up along the banks of the Mississippi river fifteen years ago, varying from fifteen inches to two feet in height. One of the trees that I saw was twenty-eight inches in diameter a foot from the ground, and thirty-two feet high. I measured it. I have some branches from that tree that will go to the World's Fair. Those trees now make a solid wall almost as impervious to wind as a board fence. I would like to have Prof. Fernow say a word about the red cedar, so it can go into our reports.

Prof. Fernow: It is the tree that has a wider distribution in the United States than most trees, growing all over the country and even in both extremes. It has a greater range than any other tree we have, except perhaps the box elder. If you want a tree that will stand anything and anywhere, take the red cedar. I would not recommend anybody, however, to plant the red cedar for economic purposes in the North. It is the tree, however, for the Southwest and the South. You know the great value of the cedar tree is its timber, which can be used for posts or pencils.

Mr. Patten: I want to say a good word for our native red pine. I believe it will endure perfectly the extreme conditions of this climate, better than any other evergreen I can name. It is decidedly preferable to the Austrian pine.

EVERGREENS.

REPORT OF COMMITTEE ON EVERGREENS.

CLARENCE WEDGE, ALBERT LEA.

Until given this subject to write upon, it had never occurred to me how important were the uses of the class of trees commonly called evergreens. As I look over my own farm premises, I discover that if all that was furnished by evergreens were removed there would be little left but the naked land. The dwelling, barns, sheds, yards, windmill and fence posts all came from the grand old pines and cedars of the North. And if to this were added the needed and proper use of the living trees for windbreak and ornament, we may easily place them at the head of the list of valuable trees. *Nature* has furnished boundless forests to our ready use for constructive purposes, but it is left for our effort to plant and nourish the banks of living green that should shelter and beautify our homes. A light and cheerful task to those who have learned the arts that do assist tree-nature, but to many a hard and doubtful one, ending in failure and disgust.

Evergreens for shelter may be planted in groves or, as we prefer, in belts of double rows, with space between the belts of several rods to admit of air and light. If planted in groves, the lower limbs die in time for want of light and give opportunity for the wind to blow through underneath the tops; while, if planted in belts, the lower outside limbs will always receive light enough to maintain their life. If several belts are planted they should each be of a different variety. The Scotch pine being of a rapid growth and obtainable at the lowest price will make the quickest and cheapest windbreak, but it is inclined to become thin in the foliage of its lower branches. The white spruce is of slow growth but of unequalled density of foliage, especially in its lower branches, thus making it one of the best varieties to alternate with the belts of pine. In growing an evergreen shelter the greatest care should be used to give the young trees clean culture. With the exception of the red cedar, there is no tree that in its youth is more likely to succumb to weeds and especially blue grass, than the evergreen. On the other hand, there is no tree that responds more surely to intelligent care and clean culture.

Planted with taste the evergreen is indispensable for ornamental planting, but its use therefor has been generally abused. The answer made by Professor Budd at the Humboldt meeting, when called upon for his choice of the five best varieties for ornamental planting, was to this point: "If I had to choose for planting, as evergreens are usually planted, directly in front of the house, I should choose just as few and just as dwarf varieties as possible." The habit of making the front yard the catch-all of every tree and bush that comes to hand is simply abominable,

and the evergreen is the very last tree that should be set there. As a background and screen and as groups and specimens, flanking the dwelling on either side, they should be planted in variety. The Scotch and red pine and red cedar, with their sombre shades, in the background; the white pine, white spruce and arbor vitæ, as broken groups, come next, and in front of all the sparkling gem of the mountains, the Colorado silver spruce in solitary magnificence. This latter tree is doubtless peculiarly adapted to our Minnesota climate in the most exposed situations and dryest seasons, and no one who has once feasted his eyes upon its peerless beauty will be satisfied until he is the proud possessor of one of the true blood. Care is necessary in planting this variety that the trees have been grown from seed secured from the eastern slope of the Rockies, as those from the western slope will be tender in our state.

In ornamental planting it is a problem how to give the trees such care as will secure their thrift. Unlike the shelter belt, a horse cultivator is out of the question. In order to avoid making too many breaks in the lawn, it has been our practice to plant mostly in groups of from three to six trees, and treat the ground occupied by the group as a little garden patch, allowing no grass within four feet of the trees. In the greater portion of the state the need of keeping the ever-encroaching blue grass away from our trees is a matter of prime importance; neglect of this largely explains the difference between the bright green of the nursery tree and the sickly brown of the lawn tree.

DECIDUOUS TREES AND SHRUBS.

REPORT OF COMMITTEE.

LYCURGUS R. MOYER, MONTEVIDEO.

The following is a list of trees and shrubs that will succeed for timber and ornamental planting in western Minnesota:

NATIVES.

Bur Oak.	Green Ash.
White Elm.	Red Elm.
Rock Elm, or Cork Elm.	White, or Silver Maple.
Basswood.	Hackberry.
Cottonwood.	Balsam Poplar.
American Aspen.	Ironwood.
Wild Red Cherry.	Choke Cherry.
Sweet Viburnum.	Red-berried Elder.
Common Elder.	Minnesota Honeysuckle.
Juneberry.	Wild Thorn.
Cornel.	Missouri Gooseberry.
Wild Black Currant.	Sumac.
Wild Grape.	Virginia Creeper.
Burning Bush.	Climbing Bittersweet.
Moodseed.	Virgin's Bower.
Wolfberry.	Green Brier.

The following is a list of trees not native to western Minnesota, that promise to do well on the prairies:

White Willow.	Red Willow.
Laurel-leaf Willow.	Rosemary-leaf Willow.
Populus Certinensis.	Laurel-leaf Poplar.
Pyramid Poplar.	Cut-leaf Birch.
Mountain Ash.	Purple Lilac.
White Lilac.	Chas X Lilac.
Persian Lilac.	Japanese Tree Lilac.
Bush Honeysuckle (several species).	Kentucky Coffee Tree.
Mock Orange.	Ninebark.
Pea Tree (several species).	Buffalo Berry.
Barberry (several species).	Clematis Jackmanii.
Snowball.	Rosa Rugosa.

EVERGREENS.

Native Juniper.	White Spruce.
Colorado Blue Spruce.	Balsam Fir.
Arbor Vitae.	Dwarf Mountain Pine.

DISCUSSION.

President Underwood: I would like to ask Judge Moyer about the aspen poplar. What is your estimate of it?

Judge Moyer: I don't think it is a very valuable tree.

President Underwood: In our part of the state the tree becomes of considerable value on account of its furnishing a great quantity of wood and being valuable for some kinds of building purposes.

Mr. Harris: My opinion is that it is worth more than the cottonwood. It is a very valuable tree to put out when you are going to put out some other variety and want the tree to protect them.

Dr. Frisselle: How many kinds of poplar are there in this part of the country that are native to Minnesota? I know of the cottonwood and the white poplar and the Lombardy poplar.

Mr. Harris: The Lombardy poplar is not a native. There is a balm of gilead that is a native in some parts of the state and the quaking aspen, and there are two kinds of cottonwood here. I could not tell you off-hand how many species there are, but there are at least four or five of that poplar family.

Judge Moyer: The cottonwood that grows native in our part of the state and the yellow cottonwood that comes from the Missouri river, are called the same by the botanists, but, as it is grown in different localities and under different circumstances, it makes a difference in its hardiness, perhaps.

REPORT ON DECIDUOUS TREES AND SHRUBS.

WM. WACHLIN, FARIBAULT.

Mr. President and members of the Association:

I am not a paper writer, nor a speech maker; I told Mr. Latham so when he notified me last spring that I had been put on a committee to write or say something about trees and shrubs, but as I am in it, I suppose I will have to do as the other fellow did when he was in Rome. I am aware that the subject assigned us is a large and very important one, and as the rest of the committee is composed of gentlemen who are no doubt better qualified than I am to write or say something both interesting and instructive, I have no fear that our subject will suffer.

Now, as I will occupy only a few minutes of your valuable time (time which could no doubt be used to better advantage by some one else), I will direct my remarks in one direction of tree planting.

TREE PLANTING IN STREETS OF CITIES AND VILLAGES.

There is nothing more beautiful and refreshing, than to see in city or village (through the residence portion at least) fine rows of trees along the streets, well cared for. It makes a place look comfortable and home-like.

In regard to success in planting, you will pardon me in referring to and quoting from Mr. W. M. Berry's paper of last year, as I know of no better method of planting than he has described.

It is important, as Mr. Berry says, to put the ground in proper condition. Of course, in street planting there is not much ground to work on, so we must do the best we can; we must dig a pretty large hole, a hole larger than would seem necessary for the small tree we are planting, but it loosens up the ground, and gives the tree a fair chance to grow. A tree for street planting should be selected with some care, all forked trees should be avoided, as high winds and storms are liable to split and ruin them.

A tree should be selected with a good straight stem, with a single leader, so that, as the tree grows it can be trimmed up to at least eight or ten feet from the ground, though, of course, the trimming must be done gradually. It will take a number of years to get a tree to the proper height, but make a proper selection at the start; there is no trouble to get a fine tree in time.

Now let us return to planting after the right kind of tree has been selected. The ends of the large roots should be smoothly trimmed on the under side, the top should be cut back to balance the roots; the tree is now ready for planting. As above stated, the hole should be quite large, to give ample room for the roots. The hole should now be filled with good rich soil, well worked in among the roots and packed quite firmly, (stable manure should not be used in tree planting); after the tree is planted the ground should be mulched with hay, wet straw or some other coarse litter. Watering should be attended to as the season may require.

The distance in street planting should not be less than twenty to twenty-five feet, as many fine rows of trees are ruined by too close planting. Of course, trees could be planted closer if every other one were cut out as they attain some size, but as few people like to cut down trees of their own planting, it is safer to not plant too close; to grow fine trees they need room to spread themselves. If a tree has the proper amount of room, there will be very little need of top pruning. Some varieties need absolutely no top pruning.

There is nothing that makes me so out of patience as to see a fine row of trees, or a single specimen, spoiled by top trimming. Of course, very often trees are planted too closely, and as they grow they crowd each other, then, to get out of the difficulty, instead of cutting some of them down a "tree butcher" is employed to remedy the trouble. The tree butchers are always professionals, at least ours are. The tree butcher comes along with his long ladder, saw, ax and other paraphernalia, and goes to work, no matter what the season of the year may be. It is all the same to him; his business is to cut and slash. Down come the tops of the trees one after the other, and when he is through a sorry sight it is; a lot of bare poles standing with hardly a leaf or branch on them, where a little while before a fine lot of trees were waving their branches in the air; and he, standing and viewing his job with the greatest satisfaction, all unconscious of the mischief he has done. By all means, when trees stand so close that they crowd each other, cut some of them down and give the rest a chance.

In regard to varieties, there are quite a good many to select from. Hard or sugar maple is one of the best on good soils; in very light soils it is not very reliable, a rather slow grower, but a beautiful tree after it has attained some size. Basswood is one of my favorites; it makes a

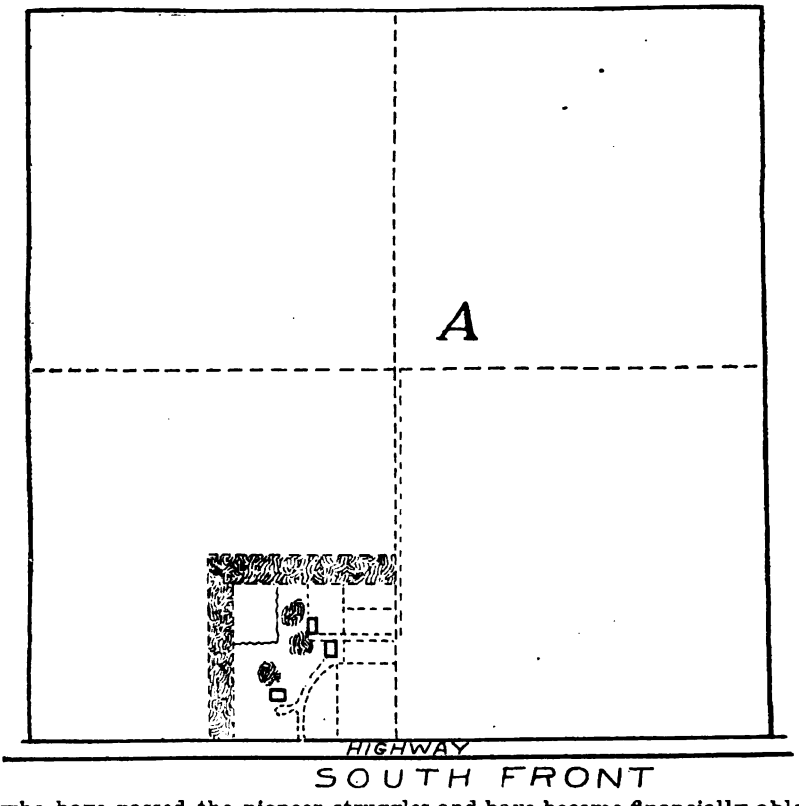
very fine tree. Hackberry is a good tree; it is not planted as much as it ought to be. Box elder is a good fast-growing tree, and if good trees are selected in the start, it makes a good tree. White and green ash are good trees. The different varieties of elms are always standard trees. Soft maple is a good tree, if the right kind of tree is selected in the first place. Hard maple, basswood, hackberry and box elder need no top pruning after planting, if they have ample room to grow in. Elm and soft maple need to be watched, as they have a tendency to grow a little wild at times.

There are other lines of tree planting, such as ornamental planting, planting for wind breaks and groves and forestry planting, all differing more or less; but, as I have already traspassed on your time, I will close my remarks, wishing the society a glorious future.

HORTICULTURE ON NEW PRAIRIE FARMS.

PROF. W. M. HAYS, FARGO, N. D.

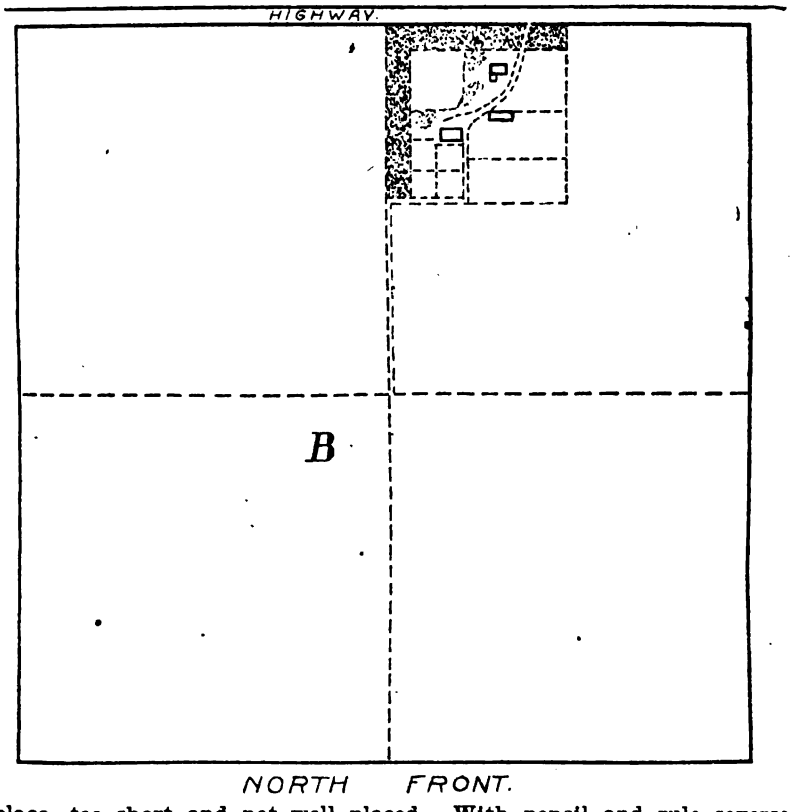
On no general farm is a knowledge of horticulture of more value than on the new farm in the great prairies of the west. The average settler has failed to grasp the few main elementary facts needed to guide him in planning one of these farms, so that it may be conveniently arranged when developed, and be well sheltered by trees. Most of the farmers



who have passed the pioneer struggles and have become financially able to erect buildings, are at a disadvantage in carrying out plans for buildings, stock lots, gardens and lawns, because their pioneer work at laying out groves and building spot was cramped and poorly calculated. On the other hand, many well arranged and thoroughly sheltered places are to be found, which nature along her wooded streams can hardly surpass.

How many of us knew no better than to plant our shelter belt only a few rods north from an east and west road, and parallel to it, with too little sheltered room between the trees and the road. The south ex-

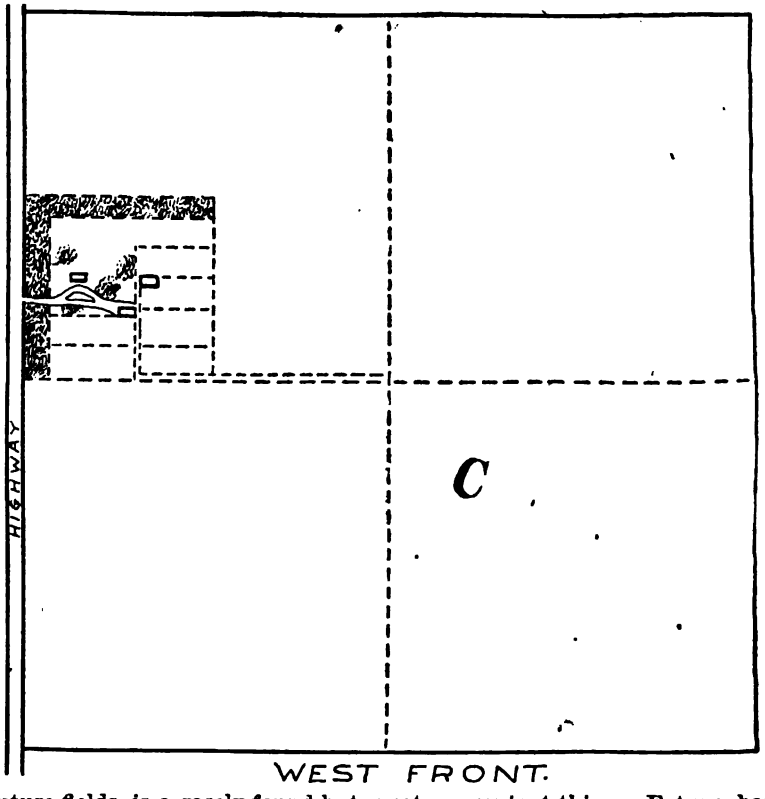
posure is all right, but the buildings, especially the barn, need be back far enough that some yards can be made in the shelter also. It is not uncommon to see such unhappy arrangements as a narrow row or belt of trees with only the east end coming up to the buildings, which face the road and the winds to the northward. Frequently the buildings are placed so close to and fronting on the road to the north or west, that if a grove is planted so as to protect against the northwest winds it must be placed across the public road, or if the land is owned by others, the buildings must be moved or, worst of all, remain unprotected. Doubtless the most common and most difficult to remedy of first plans is that of making the grove, which may be likened to the sills in the plan of the



place, too short and not well placed. With pencil and rule several provisional plans should be made and the most practical one preserved to be modified as future conditions shall demand. Nowhere is the pencil a greater machine than in laying out the farm plan.

In order to fully emphasize the value of the shelter belt of trees and to aid in making plans for getting it in the best place, it seems wise to discuss in detail a few plans of farms. It pays to look ahead and set the aim too high rather than too low in deciding upon the size of enclosure to partially surround with a grove. If larger than is at once needed, part of the land can be used for field crops or grass lands to as good advantage as if outside the grove. Ten acres is usually none too much on the farm of a

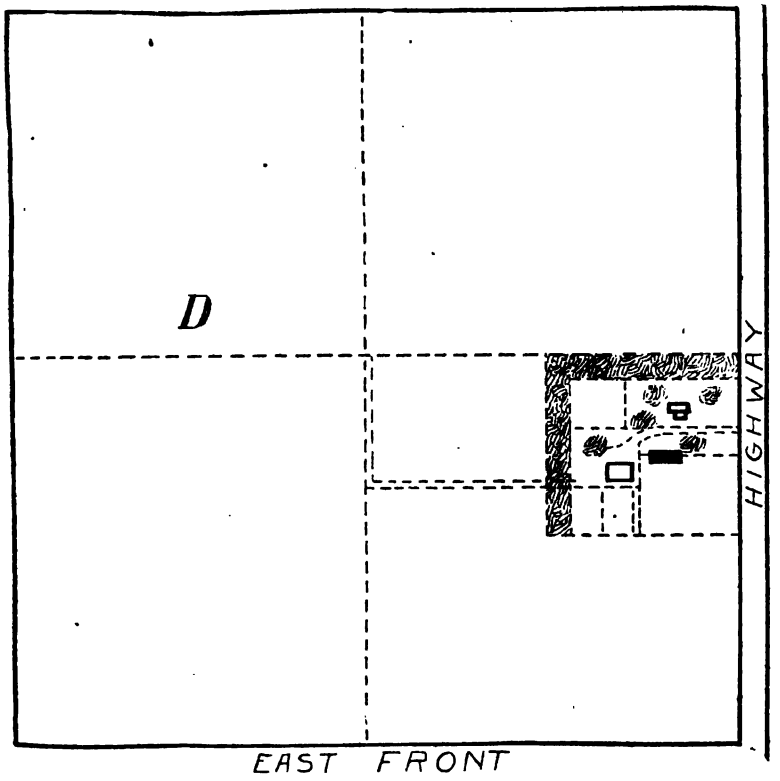
few hundred acres, while half that number would better suit a farm of less than a hundred acres, unless it is to be enlarged. Where the land is not rough, a square or nearing that form is desirable, but where hills occur they will often cause a modification of form. Ten acres laid out square, as in the sketches shown herewith, give outside dimensions of 40x40 rods; or 32x50 rods, if a rectangular shape is decided upon. The house may be located 100 to 200 feet from the road, the barn, 200 feet, more or less, from the house, and, if possible, where spacious stock yards may be placed south or east of it. A simple lane around two or more sides of the barn, and leading, as an artery from the heart, to all the barn lots and out to the center of the farm, communicating with all the



future fields, is a rarely found but most convenient thing. Future barn buildings, hennery not near the garden, and other future possibilities should be in mind.

The sketches are meant to show the general features, rather than minor details of the landscape plans. They represent the a, b, cs of farm planning, but as we have little literature along this line we need elements first. Several things are provided in each sketch. First and most important is the shelter to the north and west. Desirable distances between road and house, house and barn; ample room for barn lots; conveniently located lanes alongside the barn, leading to all yards, fields and other buildings; convenient locations for future buildings; and easy

access from highway to house, barn and fields beyond are all provided. Ample space for a garden is given and a medium sized lawn is made. Some fruit trees can be planted inside the windbreak, and there is room to the north or to the west of the grove on each plan for trees "planted where nature plants them." A good front is provided on the road in each of these sketches. Where a grove must be placed between the house and the road, the trees should be so chosen and planted that the view of passers-by is not entirely cut off, but good wind protection secured. With some such plan as this, modified, of course to suit the lay of the land, the future details can be worked in as time and means allow.



Tree planting should by no means be confined to the L-shaped shelter belt. Clumps of trees inside the enclosure, or even well placed rows to further break up the wind or to serve as "close by" shelter for the house or other building, should also be early planted, and belts to the east and south often pay.

Ornamental trees and shrubbery can hardly be regarded too highly. The main shelter-belt should be five to ten rods wide, and is easiest planted and cultivated if placed in rows. Where practicable the first land broken should be for a shelter-belt. It is necessary on new lands to grow one or more crops before planting trees; for this purpose millet is even better than small grains, as it can be planted late in the spring and harvested early, thus allowing the grass to be plowed under late in spring and early in fall, the millet in the meantime smothering all the vegetation by its rank growth.

Cheap kinds of trees which will rapidly grow into good pioneer windbreaks are, fortunately, best at first, for the most part. Some hardwooded, long-lived trees, however, should be mixed with them.

The soft maples in my father's old homestead grove in Iowa have been dead for ten years, but the black walnuts and ash, which hastened their death by being deeper rooted in dry years, now stand as monuments to the man who planted them thirty-five years ago.

White willow, cottonwood, box elder, soft maple, white ash and white elm stand as the old favorites and have done an immense amount of service as windbreaks all over the prairie regions. A few of the Russian willows and poplars are becoming prominent pioneer trees. Scotch and white pines and some other evergreens may be planted with profit, even far to the northwest, after enough of a grove has been produced to make a snow gatherer and to show where these trees may be planted that the snow will not break them down too badly. Farther south, they may be planted at first.

Trees in belts should be planted thickly, especially farther west where the forest conditions must be early reached that snow and rain may be held to mitigate the effects of drouth. As close as six or eight feet apart is often desirable. The custom of placing a single or double hedge-row of willows along the west and north sides of these shelter belts seems as wise in the far northwest as in the great corn belt, where this plan is so generally popular. Different species can be placed in separate rows. Cultivation should be complete for a few to several years, and should continue after harvest. Mulching heavily with straw or coarse barn litter, where there is little danger from fire, often helps the trees to get the start of quack grass and other strong-sodded grasses. Barbed wire fences, costing twelve to twenty cents per rod, are a cheap protection from stock.

THE FRUIT AND VEGETABLE GARDEN.

Ample protected space should be provided inside the grove for gardens and orchards. Not that they shall all be developed at once, but that there shall be room for orchards, rotation of garden crops with millet and clover and for any ordinary requirements for fruit trees or gardens in the future, and a little extra space to serve for calf pastures, soiling crops or other special crop. A study of the economies, the use of time or labor, the health and enjoyment of the family on farms in pioneer sections convinces one that no farmer can afford to fail to spend the time in winter to read and learn how to grow vegetables and small fruits, the money for seeds and plants or the labor of raising all of these that the family wants. It is means and energies better spent than in raising the small amount more of 50 to 75 cent wheat that could be cared for, instead of a small garden.

The farmer gets a large part of his remuneration out of having the farm as a home, having his food produced cheaply and of good quality, and from the enjoyments of possessing with undisputed right a property which he can build up and develop into a pleasant place to live. The non-resident, arms-length farmer who gets few of these things and only expects surplus cash, often fails in competition with the bona fide resident farmer. Farmers as a rule work far harder to get the renumeration which comes from outside in the form of a balance in cash account than they do for the living they take at once from the farm without the help of the middleman or manufacturer. Our wheat farmers do not spend one-third

the attention to home grown foods and shelter, that would pay them to do. Work devoted to producing food for the family in the garden is rewarded without any regard to high or low prices.

Every farmer should raise not only the most important classes of vegetables and small fruits, but plenty of nearly all that can be successfully grown. Canning and other ways of preserving makes possible having a supply of fruits and vegetables all winter as well as all summer. Variety of food is not too expensive for our trotting horses or our thoroughbred cattle, and to keep our boys and girls and wives as well as ourselves in the flower of condition, physically, mentally and morally, we need this variety.

DISCUSSION.

Mr. Barrett: I understood Professor Hays to say that the best way to plant trees is to have them about six feet apart. I prefer to have them much thicker in the outset, so they will protect each other, cutting them out subsequently as they develop. I think we should have windbreaks very thick on account of the great winds we have in this part of the country. I differ from Prof. Hays in regard to cultivating until after the harvest. My reasons are based upon my own experience as well as the testimony of others who have experimented in this line, and my opinion is that we had better stop cultivating our trees about the middle of July, certainly not extending it beyond the end of that month, and for this reason —the trees must have time to ripen up. They are in the full tide of their development about the middle of July, and I think it is better to stop then. Let the weeds grow, even if they go to seed. The weeds are a protection to a great extent both in the summer and winter seasons for these trees. If we cultivate in that way from season to season, stopping about the middle of July, we will have our trees in better shape for the winter campaign than otherwise; whereas, if we extend it up to harvest time we are quickening the leaf properties of the tree and it will not recuperate, but will be tender and not prepared for the winter season.

Prof. Hays: I have learned since coming to the Northwest how rapidly the weeds grow. In our country the quack grass will constantly get in and destroy our trees, if it is not constantly cultivated out. I have seen a great many tree-claims and plantations in our state of North Dakota this last summer that have been very seriously injured by not receiving careful cultivation until they were four or five years old. I believe in a good deal of cultivation, but I would not go very deep in this late cultivation or in any cultivation.

Mr. Wilcox: Can you destroy quack grass by cultivation?

Prof. Hays: You can keep it down. If you break it up and grow a couple of crops and get your land ready for trees, so there is practically no quack grass on it, by cultivating it carefully for a few years you will get your trees started before the quack grass amounts to much.

Mr. Wilcox: I have had some little experience and I would like to throw a little light upon this subject if I can. The ground that I planted, commencing in the season of 1883, was broken in the season of 1874. My system of planting is to plant in perfectly straight rows, an air line, so to speak. I hardly ever cultivate more than two years with a team and cultivator. After that I allow my hogs to do the cultivation. My system of cultivation the first year is with a common corn cultivator, and if hoed both ways they can be kept reasonably clean. I stop before harvest, and if any weeds start then it is cultivated the next year in a different way altogether. My rows being perfectly straight, I allow the weeds to get up about six inches high and then take a sharp plow with a very sharp coulter, plowing just as shallow as possible. The plow should be perfectly bright and scoured so it will not clog at all. I turn a little furrow as close to the tree as possible—and that is one place where straight rows come in handy, you can get closer than when they vary from a straight line. Then I take a hoe and brush these out, and as soon as the weeds have had time to die I turn the soil again, which is just the same as summer fallowing. My trees have been remarked upon by the county auditor as being the best trees of their age in our county, yet that is all the cultivation that they have had. I plant my rows of trees as I plant corn, seven feet one way by three and a half the other. I will say right here that they have long since passed the time when they had to be thinned out.

Mr. Barrett: I think the society will make a serious mistake if it entertains the idea of cultivating so late in the season. I wish that Mr. Smith would give us a few ideas upon it.

Mr. Smith: I simply endorse the plan that the gentleman who spoke last outlined.

Pres. Underwood: As I understand it, both systems have been thoroughly advocated here.

Prof. Hays: Yes. When I made the statement regarding late cultivation it was intended for those western sections where the quack grass grows all over the prairie. When land is broken up this grass takes possession of it, if it is not looked

after very closely. I would not urge late cultivation under other conditions at all. I have had considerable experience in this matter and I think the plan outlined is a good one.

Mr. Johnson: I have traveled some in South Dakota and made some observations that I think are right in line with this matter. I heard the statement made that it was impossible to raise trees there on account of its being so dry, and I went there partially to see about it. I have seen trees that it was almost impossible to make grow, because they were almost smothered in quack grass. In many cases I would not have taken the plantation and resurrected it from the dead, if it was given to me. I would rather take a piece of land near it and commence new. I think this state of affairs was partially due to the fact that the land was put out to trees too soon after being broken up. When this is the case it is very liable to go back to grass if neglected.

Dr. Wentworth: I have had quite a little experience in growing forest trees, and I have had to contend with all the difficulties which have been mentioned. I have succeeded in getting away with the weeds and at the same time avoided the evil of very late cultivation. I would recommend this plan: Continue your ordinary cultivation until perhaps the middle of July, and then change to surface cultivation, just cutting the the weeds and not developing the trees at all. This can be done.

ELECTRICITY.

NOTES ON THE APPLICATION OF ELECTRICITY TO PLANT GROWTH.

PROF. SAMUEL B. GREEN, ST. ANTHONY PARK.

We hear much about electricity, in fact, it has come to the front where we must profess to know something about this strange form of energy in order to keep up with the times. Our knowing ones prophesy that all sorts of things will be done with it, and talk about converting the energy of the tides, the Falls of Niagara and the winds into electricity for warming our houses, cooking our food and running our factories, when the supply of coal shall be exhausted; and even now it is said to be the intention of the Niagara Falls Power Co. to transmit electric power to Chicago within a year or two. As to what electricity is and whence it comes, we know but little more than the motoneer who calls to his companion to "turn on the juice" to start the electric cars; or the poor woman who is said to have likened the electric car to a witch riding a broomstick. Electricity is fast coming into universal use in the various occupations of life, and, of course, a few of us wiseacres in horticulture have begun to talk about its use in our line; but, really, we are talking about nothing new, for ever since electricity became a science there have been many efforts made by scientists to find its relation to both plant and animal life.

It is well known that currents of electricity exist in the atmosphere. There is a constant change of electricity from earth to air and from air to earth, the latter being the great reservoir for all electricity. "Hills, mountain peaks, trees, chimneys, spires, in fact, all points elevated above the earth's surface, assist greatly in charging and discharging the atmosphere. If two iron rods are driven into the ground and connected by a copper wire it is found that there is a current of electricity passing through the wire, showing that there are such currents passing through the ground." Again, Sachs has shown that each movement of water in the tissues of the plant induces feeble electric currents. In fact, this mysterous something, this energy we call electricity, pervades almost every form of matter.

But I do not mean to take up your time with a lot of rambling abstractions, but wish to call your attention to the experiments that have been made in using this force in a practical way in horticulture.

There are at least two ways of using electrical energy to influence plant growth; one is where the current is brought in direct contact with the plant itself, and the other where it is used in its form as light. Let us consider the former method first.

The early investigations to determine the effect of electricity on plant growth gave in many cases contradictory results, and it was not until after 1845 that practical electro-culture was undertaken. Williamson

suggested the use of gigantic electro-static machines, but the attempts were fruitless. The method most generally adopted in experiments consisted of two metallic plates, one of copper and one of zinc, placed in the soil and connected by wires.

Shepard employed this method, and his experiments showed that electricty increased the returns from root crops, while grass perished near the electrodes, and plants developed without the use of electricity were inferior to those grown under its influence. Hubeck in 1847 came to the conclusion that seeds germinated more rapidly and buckwheat gave larger returns when electrified; in all other cases the electric current produced no result. After some years had elapsed Fichtner, in the same direction, employed a battery, the two wires of which were placed in the soil, parallel to each other. Between the wires were planted peas, grass and barley, and in every case the crop showed an increase of from thirteen to twenty-seven per cent., when compared with ordinary methods of cultivation.

Fischer of Waldheim, believing atmospheric electricity to aid much in the growth and development of plants, made the following tests: He placed metallic supports to the number of about sixty around each "hektare (2.47 acres)of loam;" these supports were provided at their summit with electrical accumulators in the form of crowns surmounted with teeth; the collectors were united by metallic connection. The result of this culture applied to cereals was to increase the crop by half.

The following experiment was also tried: Metallic plates, sixty-five centimeters (25.6 inches) by forty centimeters (15.7 inches) were placed in the soil. These plates were alternately of zinc and copper, and placed about 100 feet apart, connected two and two by a wire. The result was to increase from twofold to fourfold the production of certain garden plants. Mr. Fischer says that it is evidently proved that electricity aids in the most complete breaking up of the soil constituents. There can be no doubt of the truth of this statement, but he goes on to say that plants treated with electricity mature more quickly, are almost *always perfectly healthy* and are not susceptible to injury by fungous diseases, which seems to show that the electric current acts directly on the sprout itself, aside from its action on the plant food in the soil.

Some years later N. Specnew was led to investigate the influence of electricity on plants in every stage of their development; the results of his experiments were most satisfactory. He began by submitting different seeds to the action of an electric current and found that their development was rendered more rapid and complete. The following table shows his results:

	Peas.	Beans.	Barley.	Sunflowers.
Electrified seeds developed in.....	2.5 days.	3 days.	2 days.	8.5 days.
Non-electrified seeds developed in.....	4 days.	6 days.	5 days.	15 days.

It was also observed that the plants coming from electrified seeds were better developed, their leaves were much larger and their colors brighter than those plants growing from non-electrified seeds; but the yield was not affected.

At the botanical garden at Kew, England, the following experiment was tried: Wires were so arranged in the soil that an electric current passed through the ground. This method was applied to pot herbs and flowering plants and also to the growing of garden produce; in the latter case the result was a large crop and the vegetables grown were of enormous size.

(Extract from Mass. Agl. College bulletin by Prof. C. D. Warner.)

"Extensive experiments in electro-culture were also made at Pskoo, Russia. Plots of earth were sown to rye, corn, oats, barley, peas, clover and flax; around these respective plots were placed insulating rods, on the top of which were crown-shaped collectors, the latter connected by means of wires. Atmospheric electricity was thus collected about the seeds and the latter matured in a highly electrified atmosphere. The plots were submitted to identical conditions, and the experiments were carried on for five years. The results showed a considerable increase in the yield of seed and straw, the ripening was more rapid, and the barley ripened nearly two weeks earlier with electro-culture. Potatoes grown by the latter method were seldom diseased, only 0 to 5 per cent. against 10 to 40 per cent. by ordinary culture."

Macagno, also, believing that the passage of electricity from air through the vines to the earth would stimulate growth, selected a certain number of vines, all of the same variety and all in the same condition of health and development. Sixteen vines were submitted to the experiment and sixteen were left to natural influences. In the ends of the vines under treatment, pointed platinum wires were inserted, to which were attached copper wires leading to the tops of tall poles near the vines; at the base of these same vines other platinum wires were inserted and connected by copper wires with the soil. At the close of the experiment, which began April 15 and lasted till September 16, the wood, leaves and fruit of both sets of vines were submitted to a careful analysis, which showed that the percentage of moisture and sugar was greater and the undesirable acid lower in those vines subject to electrical influences than in those left to natural conditions.

The following experiments were made in 1891 at the Massachusetts experiment station: Several plots were prepared in the greenhouse, all of which had the same kind of soil and were subjected to like influences and conditions. A large number of the copper wires were strung through each of two plots and covered with soil to a little depth, so the roots would come in contact with them. Two electric gardens were thus prepared and each furnished with two common battery cells, so arranged as to allow continuous currents to pass through each series of wires. Near each electric garden was a plot prepared in the same manner, save the electric apparatus.

The place chosen for the experiments was in a part of the greenhouse which was given up largely to the raising of lettuce, and the gardens were located where much trouble from mildew had been experienced. The reason for this choice of location was to notice the effect, if any, of electricity upon mildew, this disease being, as is well known, a source of much trouble to those who grow early lettuce. The largest heads were over the greatest number of wires and nearest the electrodes. It was further noticed that the healthiest and largest plants, as soon as the current became feeble or ceased altogether, began to be affected with mildew. On examining the roots of the plants it was found that they had grown about the wires, as if there they found their greatest amount of nourishment; the roots were healthy and in no way appeared to have been injured by the current, but, rather, much benefited by the electrical influences.

Beside garden A was prepared another plot of the same dimensions, having the same kind of soil and treated in like manner as the first, but the electrical apparatus and wires were wanting. At the close of the experiments only three plants had partially developed and two of these were nearly destroyed by mildew, one only was free from disease. The results, therefore, show that the healthiest and largest plants grew in the electric plot. The experiment was repeated with like results.

Everything considered, the results in these two trials were in favor of electricity. Those plants subjected to the greatest electrical influence were hardier, healthier, larger, had better color and were much less affected by mildew than the others. Experiments were made with various grasses but no marked results were obtained.

ELECTRICAL EXPERIMENTS AT THE MINNESOTA EXPERIMENT STATION IN 1892.

These were commenced Feb. 15th and concluded April 14th. Two plots side by side, each 3x3 feet, were selected in the greenhouse. One was treated with electricity, the other without. The electricity was ap plied under the rows of plants by a wire covered one inch deep. Sowings were made of lettuce, radish, wheat, oats, corn and beans on Feb. 15th. At the end of each row for a space of six inches the seed was sown directly on the wire, but this contact with the electric wire did not produce any apparent effect in lessening the time required for the seed to germinate, nor did the plants grow any stronger where brought in contact with the wire. Seeds of same kinds germinated at practically the same time in each plot, except corn and beans, which were about three days behind in that not treated.

Radishes.—There was no difference in the growth of this crop in the two plots.

Lettuce.—No difference—if anything, that not electrified did the best.

Wheat and oats.—In this case the results were largely in favor of the electrified row, it being 30 inches high, which was six inches higher than the other, and rather more healthy.

Beans.—Those electrified matured edible pods, while the others only got into blossom when the experiment was finished.

Corn.—That electrified grew very healthy and strong and 52 inches high, the other only 32 inches high.

Temperature of the different plots varied from 2 to 5 degrees during the experiment, sometimes in favor of one and again in favor of the other, but the average was about 2 degrees higher for the electrified than for the other.

Two cells were used for each wire and 36 pounds of sulphate of copper was used up during the two months the experiment was in progress.

The roots seemed to run regardless of the copper wires. Results were not conclusive and may be attributed to the difference in temperature, although a very slight increase in growth of a few kinds seemed due to electricity.

In February, seed of corn, beans, barley, wheat, oats, radish and lettuce were moistened over night and were then treated with six Bunson cells through an inductive coil and sown along side of part of the same lot of seed not treated. No results could be seen which could be attributed to the use of electricity.

In February, seed of corn, beans, barley, wheat, oats, radish and lettuce was treated with an inductive coil and sown alongside of seed not so treated, but subjected in every other way to the same conditions. It was noticed that the electrified wheat germinated about twelve hours ahead of that not electrified, but other than this no difference was noted.

ELECTRIC LIGHT EXPERIMENT OF C. W. SIEMENS, ENGLAND.

(Condensed from the first Cornell bulletin on electro-horticulture.)

In the winter of 1880-81 experiments were conducted in which a lamp of 4,000 candle power was used, and it was placed inside a house of 2,318 cubic feet capacity. The light was run all night, and the arc was at first not protected by a globe. The "results were anything but satisfactory," the plants soon becoming withered. At this point a globe of clear glass was placed upon the lamp, and thereafter the most satisfactory results were obtained. Peas, raspberries, strawberries, grapes, melons and bananas fruited early and abundantly under continuous light, solar light by day and electric light by night. The strawberries are said to have been "of excellent flavors and color" and the "grapes of stronger flavor than usual." The bananas were "pronounced by competent judges unsurpassed in flavor," and the melons were "remarkable for size and aromatic flavor." Wheat, barley and oats grew so rapidly that they fell to the ground of their own weight. The beneficial influence of the clear glass globe was, therefore, most marked. "The effect of interposing a mere sheet of thin glass between the plants and the source of electric light was most striking. On placing such a sheet of clear glass so as to intercept the rays of the electric light from a portion only of a plant, for instance, a tomato plant, it was most distinctly shown upon the leaves. The portion of the plant under the direct influence of the naked electric light, though a distance from it of nine to ten feet, was shriveled, whereas, that portion under cover of the clear glass continued to show a healthy appearance, and this line of demarkation was distinctly visible on individual leaves. Not only the leaves but the young stems of the plants soon showed signs of destruction when exposed to the naked electric light, and these destructive influences were perceptible, though in a less marked degree, at a distance of twenty feet from the source of light."

In another series of experiments, Siemens placed an electric lamp of 1,400 candle power about seven feet above a sunken melon pit which was covered with glass. The light was modified by a clear glass globe. In the pit seeds and plants of mustard, carrots, turnips, beans, cucumbers and melons were placed. The light ran six hours each night, and the plants had sunlight during the day. In all cases those plants "exposed to both sources of light showed a decided superiority in vigor over all the others, and the green of the leaf was of a dark rich hue." Heliotropism, i. e., the turning of the plants towards the light, was observed in the young mustard plants. Electric light appeared to be about half as effective as daylight. Flowering was hastened in melons and other plants under the glass. Strawberries which were just setting fruit were put in one of the pits, and part of them were kept dark at night, while the others were exposed to the light. After fourteen days, the light having burned twelve nights, most of the fruits on the lighted plants "had at-

tained to ripeness and presented a rich coloring, while the fruit on those plants that had been exposed to sunlight only had by this time scarcely begun to show even a sign of redness."

At the close of his experiments Siemens was very sanguine that the electric light could be profitably employed in horticulture, and he used the term "electro-horticulture" to designate this new application of electric energy. He anticipated that in the future "the horticulturist will have the means of making himself practically independent of solar light for producing a high quality of fruit at all seasons of the year." He thought that the addition of electric light enabled plants to bear at a higher temperature in greenhouses than they otherwise could. Nature made the following comments upon Dr. Siemens' experiments: "But the scientific interest of its present application must rest mainly on the fact that the cycle of transformation of energy engaged in plant life is now complete, and that, starting from the energy stored up in vegetable fuel, we can run through the changes from heat to electricity, and thence to light, which we now know we can store up in vegetable fuel again."

EXPERIMENTS AT CORNELL UNIVERSITY.

The most complete and practical experiments made with the electric light are those now being carried on at Cornell University by Prof. L. H. Bailey, and on which there have been two bulletins issued. In his last bulletin he summarizes his observations as follows:

1. The influence of the electric arc light upon greenhouse plants is greatly modified by the use of a clear glass globe or the interposition of a glass roof. Plants which are much injured by a naked light may be benefitted by a protected light.

2. As a rule plants are earlier under the electric light than when grown in ordinary conditions.

3. The light can be suspended above the house with good effect.

4. Lettuce is greatly benefited by the electric light. An average of five hours of light per night at a distance of ten and twelve feet hastened maturity from a week to ten days. Even at forty feet in only diffused light the effect was marked. The light appeared to injure young, newly transplanted plants.

5 Radishes were also benefited by the light, but not to a great extent. When the light was hung in the house, however, whether naked or protected by a globe, radishes were injured.

6. Beets and spinach appeared to be slightly benefited by the light.

7. Cauliflowers under the light tended to grow taller than in ordinary conditions, and to make fewer and smaller heads.

8. Violets and daisies bloomed earlier in the light house. This corroborates results obtained with other flowers in previous experiments.

9. The electric light does not appear to determine or modify the hours of growth of lettuce and some other plants which have been studied in this particular. Plants which are benefited simply grow more rapidly during the customary periods.

10. I am convinced that the electric light can be used to advantage in the forcing of some plants.

The experiments carried on by W. W. Rawson at Arlington, Mass., have attracted wide attention from the magnitude of the undertaking and from

their being the first successful applications of the electricity to commercial plant growing. The following is a description of his methods of work and the results:

Thirteen houses are devoted to lettuce and one of them covers nearly one-third of an acre. This great house was built last year at an expense of $5,000; it is so large that the ground inside is plowed with steam, it is 33 by 370 feet in outside dimensions, 15 feet to the ridge, 3½ feet high on the south or lower side and 12 feet on the north side. From this house Mr. Rawson takes at one crop 2,000 dozen heads of lettuce, and the heads are twice the size of those which we ordinarily see on the market. He was, probably, the first to use the electric light for the commercial growing of plants. His attention was called to the subject by observing the beneficial effects of street lamps which hung near his houses. He now runs three 2,000 candle-power arc lights all night throughout the winter for the sole purpose of hastening the growth of lettuce. Mr. Rawson declares that these lights hasten the maturity of lettuce by 10 per cent.; and says that the gain produced upon one crop pays for the running of the lamps for the entire winter. He calculates that there is an average gain of five days for each crop, or a total saving of fifteen days for the entire winter. He also says that the plants head up better under the light and that the quality is superior. The effect of the light is marked at a distance of 100 feet from the lamp.

THE LEAVES OF OUR HARDY TREES.

O. F. BRAND, FARIBAULT.

Mr. President, ladies and gentlemen: The subject assigned to me is one fit for a book of 500 pages by a Darwin, Gray or Goodall, and I am compelled to say that the best thing about this article as written by me will be its brevity.

Primarily, the lease of life of any given plant is fixed by the inherited character; secondarily, the lease of life is modified by external influences. Everything that has life must feed upon food, either organic or inorganic, or both. Plants feed largely on inorganic material, although the ways by which certain granules under the influence of certain rays of light can cause the dissociation of carbon from oxygen, with which it is combined in carbonic acid, and bring about the formation of an organic substance from materials wholly inorganic, are processes to me entirely unknown. That such processes are being carried on in the leaves of trees during the growing season, there can be no doubt.

The Great Author of all life gave to such plants as trees, leaf, stem and root, as three general organs, each having its own peculiar function, and although the leaf is a minute thing when compared to the tons of solid matter contained in the stem of one of our large giants of the forest, yet there could never have been a giant tree or tree of any size, whatever, had it not been for the little industrious leaf. I have, heretofore, compared the leaves of a tree to so many laboratories, or workshops, having certain well defined kinds of work each year and each month during the growing season. We understand that the living parts of a tree of the exogenous kind are the rootlets, the buds and leaves and a zone of the newest wood and newest bark. These parts are renewed each year. This annual work of renewal is mainly done by the leaves, and among our very hardy forest trees, such as pine, is mostly accomplished out of inorganic material. We know that in burning a pine tree the ash left is very inconsiderable, but represents nearly all that has been taken from the soil; the rest has returned to the atmosphere, from whence it nearly all came. The leaves of our maples, and some other leaves, store up in the tree a good supply of substances easily converted into sugar. Leaves of apple trees have a similar work to do to that done by the maples; they have to make the annual zone of new wood and bark, form buds for the next spring, ripen a crop of apples, and then store up in the tree enough reserve food material to carry the tree safely through our most trying winters. This reserve food is largely starch or sugar, and it seems to me that with a tree of proper cell structure the question of its hardiness or adaptation, then, lies in the ability of the leaf to store up in the tree a proper amount of this reserve food during any and all climatic changes which will environ it in any given country during a long term of years.

During the past forty years we find that among foreign and American apple trees introduced here from other parts, there has not been another one with a leaf capable of doing the work that has been done by the leaves of the Duchess of Oldenburg. At no time during my ex-

perience has that fact been made so evident as during the past summer. I know of but one variety that stood the trying test of last June so well. That one variety is the Peerless. It is a matter of easy proof that among tens of thousands of Peerless trees there was no injury to its leaves; while such varieties as Whitney, McMahon and Transcendent crab were so badly injured that they did not make the growth of a single bud after the 15th day of June. This leaf injury was not blight, but extended over a wide area. Testimony as to the perfect condition of the Peerless leaves was received from parties in Maine, Ohio, Colorado, and from central Illinois to Manitoba.

I may here remark that it was evidently owing to a desire on the part of our President Underwood and Secretary Latham that a waiting and anxious world should know about the superior merits of this Peerless apple tree, that this subject was assigned to me. If they were of the other sex I would say that their keen discernment of that which is right and appropriate was only exceeded by their good looks and their winning ways.

To return to the subject matter of hardy leaves. I remarked in the beginning that, secondarily, the lease of the life of a given plant is modified by external influences. One of these external influences may easily be shown in the great and widespread injury to the leaves of nearly all trees last June. The variety which entirely escaped injury, when scattered in large numbers over a wide area, must possess the best leaf. This is natural selection. The fittest has survived. Nature does not select every year, or every ten years, but sooner or later she makes the selection, and we must then be content with her choice. There is no apple tree on this continent, tested for thirty years, that approaches anywhere near the perfection of its leaf to the Duchess of Oldenburg. It does well on the forty-fifth parallel of north latitude, and does equally well 800 miles further south, in Georgia, Alabama and North Carolina. You will ask, what is there uncommon about the leaf? Among other things characteristic of it is its great size, its form, its thickness, its glossy upper surface and lastly its superior cell structure. The first four are visible to all who have the disposition to examine, the last is simply my opinion. There is one other feature I will mention, and that is the great size of the terminal leaves. All of these important characteristics have been retained and some of them improved on in that celebrated child of the Duchess, namely, the Peerless.

Leaves also serve other important missions in the economy of nature. They help to purify the atmosphere of poisonous gases and make this earth a better home for man. They also play an important part in the formation of vegetable mould. We have it on the authority of Darwin and others that leaves go on accumulating lime as long as they remain on the trees. During their decay they generate an abundance of various acids grouped together under the term humus acids.

And now as I have briefly mentioned a few of the prominent characteristics of leaves, I will "leave" the subject in your hands and extend to each and all of you the wish that as you turn the leaves of life each one turned may prove more bright and interesting than the one last passed.

NOMENCLATURE AND CATALOGUE.

REPORT OF THE COMMITTEE ON NOMENCLATURE AND CATALOGUE.

J. S. HARRIS.

Mr. President and members of the Minnesota State Horticultural Society:

There is no subject that comes within the scope of the work of this society of more importance than that of nomenclature and catalogue, and no committee whose duties are more arduous than those to whom these subjects have been assigned. We have on former occasions spoken of the importance of having a correct nomenclature for the fruits grown in this state, and it seems to us one of the first duties of this society is to establish correct names for all of the many varieties of fruit which come before us for discussion, examination, adoption or rejection. Without a correct nomenclature, uniform in every particular, with that in use in other states and other societies, we cannot possibly guard our planters from being continuously imposed upon or misled. The reputation of fine and worthy varieties is liable to be seriously damaged, their successful introduction and culture retarded, and the business of the propagator and planter result in confusion and loss. So little knowledge of the merits of fruits by their names have a large per cent. of the purchasers and planters of trees, that a sharp agent has a great advantage over them; and it is one of the first duties of this society to disseminate knowledge that shall prove a protection against either fraud or mistakes. (As a rule we believe the agents of legitimate nurseries are honest well-meaning men, but frequently woefully ignorant or deficient in their knowledge of varieties; and, unfortunately, we occasionally hear of some most villianous association, who do not grow a tree and have no use for an honest agent.)

We have found through our attendance at fruit exhibitions and visits among fruit growers that there exists very great confusion in the names of varieties, even among those who ought to be reasonably well posted, and with the newer Russian varieties it is almost chaotic. The evil is with us, it is too late to prevent it, but we should as fast as possible take steps to correct it, or disasters will continue to follow. In no place is this condition of things more annoying than in competitors' exhibits, where to save money and encourage honest competition every variety for which prizes are offered should be correctly described, that the judges may be able to make just awards. At some county fairs scarcely one-half of the varieties are correctly named, and it is not unusual to see the same variety shown under several names by the individuals exhibiting them; and as a result the educational influence of the exhibition is lost to both exhibitor and visitor. At one fair last season we saw the Wealthy apple shown as Duchess, Walbridge and unknown; the Utter as Wealthy, Walbridge and Plumb Cider; the Plumb Cider as Ben Davis and Walbridge;

Talman Sweet as Golden Russet and so on, several others after the same style. Doubtless, there was no intention of wrong in this, they have at sometime planted trees under those names and are generally glad to be set right.

Many people who are not familiar with fruits take advantage of the opportunities afforded at the fairs to make out lists of varieties for the next spring's planting, and to them it is doubly important that all good varieties should be shown under their correct names, for the reason that the nurseryman with whom they place the order will be more than likely to fill with just the varieties called for, and if they live to bear fruit other disapointments have come and an honest nurseryman is blamed for them.

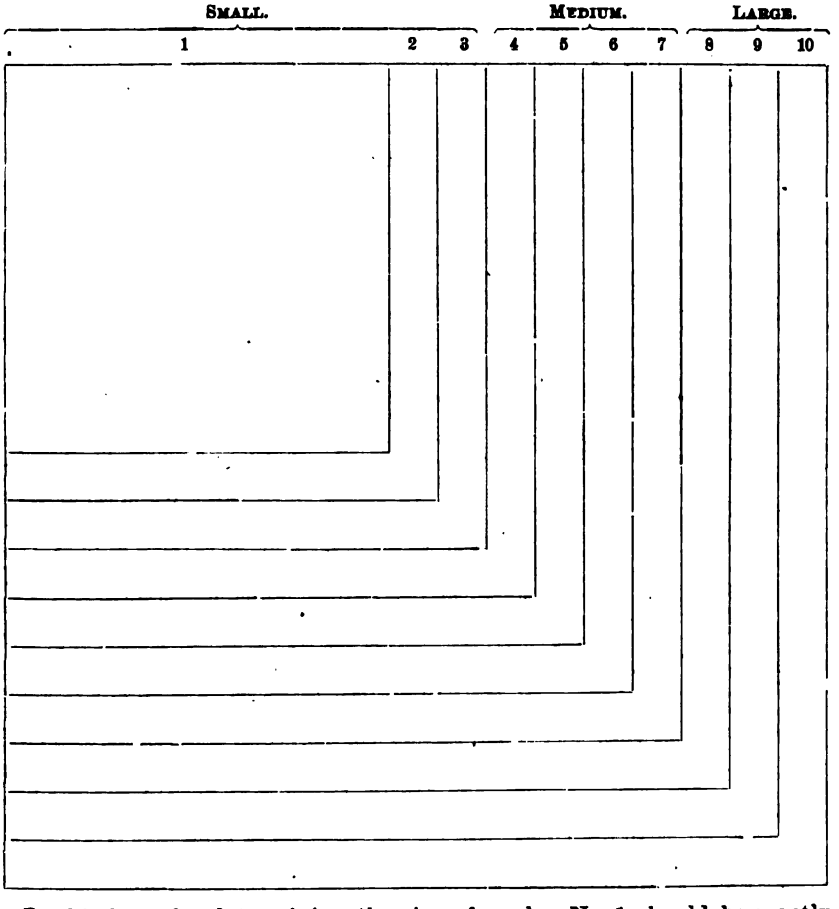
In view of the above reasons and many others that your time will not permit us to discuss, we recommend that hereafter every variety and species of fruit that comes before the society for recommendation for trial or general cultivation in any section of this state, shall be catalogued and plainly described under its true name, or, if an unnamed seedling, that it shall be named according to the rules of the American Pomological Society. Also, that all other varieties now being or having been grown in this state, including all of the Russian varieties as fast as the true name can be ascertained, and all new seedlings hereafter produced that give any promise of value shall be catalogued and described; giving name and P. O. address of the originator, wherever known, giving size, form, color, and season of the fruit, the uses and value of the fruit for dessert, cooking and market, and the comparative hardiness of the tree, taking the Oldenburg as the highest standard, using numbers as far as practicable from one to ten, ten to denote perfection; as a means for education and protection in the future.

The observations of the past season have confirmed us in the opinion that there are a number of varieties of the newer Russians that are destined to play a conspicuous part in the future pomology of the Northwest, and that no time should be wasted before sifting out the best and most valuable sorts and ascertaining their correct names. If there are not a half-dozen varieties made out of the Oldenburg, there are that number going by different names that are so nearly alike in tree, quality of fruit and season, that no one planter will want more than one, or at most two of them. We would suggest saving the best two that differ the most and discarding the remainder, or throwing them all into one batch and having them known only by the name Oldenburg. The man who wants only six will then be protected from planting thirty more of the same kind under other names. The same is also true of some others of them. The Hibernal, Lieby, Recumbent and Ostrekoff Glass are so nearly identical, if not positively one variety, that only one of them should be retained.

A slight mistake was made in printing the form of scale for determining the size of apples by numbers, presented with our last report, the square, No. 1, being one-fourth of an inch too large. No. 1 should be exactly two inches square and the outside line of each additional number, one-fourth of an inch larger. This scale is being received with favor and we recommend that it appear as corrected in the forthcoming volume of transactions. We also submit for your approval a form of catalogue.

The following abbreviations are used in the description of apples:

Form.	Color.
r. Roundish.	g. Greenish.
r. c. Roundish concave.	y. Yellow.
f. c. Flat concave.	g. y. Greenish yellow.
c. Concave.	r. Red.
r. ob. Flatish round.	y. r. Yellow and red.
r. ov. Round ovate.	r. s. Red striped.
	rus. Russeted.



In this form for determining the size of apples, No. 1 should be exactly two inches square and each additional number or square exactly one-fourth of an inch larger, so that the outside lines of No. 10 will form an exact square of four and one-fourth inches.

APPLES—PYRUS MALUS.

NAME OF VARIETY.	DESCRIPTION.						USE AND VALUE.				Remarks.
	Size.	Form.	Color	Flavor.	Season.	Origin.	Dessert.	Kitchen.	Market.	Hardiness.	
Alexander (Emperor Alexander)	10	Round, conical	Red striped	Acid	Oct., Nov.	Russia	2	9	9	8	Shy bearer and subject to blight.
Antonovka	6	Round, conical	Greenish yellow	Sl'tly sub acid	Nov., Dec.	Russia	7	8	7	9	Best on high limestone soils.
Anis, Yellow or Red.	4	Flat, con'l. rib'd.	Gr'nish yel.&red st'p'd	Sub-acid	Sept.,Nov.	Russia	5	6	6	10	Tree good, shy bearer while young.
Anisim	4	Round, conical	Red, whitish blows	Sub-acid	Oct., Dec.	Russia	7	6	10	..	Very b'utiful fruit;enorm'sly prod'tve
Ben Davis	7	Round, conical	Yellow. red striped	Sub-acid	Dec., Mar.	Kentucky	5	6	10	6	Tree short-lived, grown in Houston and Fillmore counties.
Borovinka	5 to 6	Flat, round	Green,yel., red striped	Sub-acid	Sept.	Russia	7	8	10	10	Much like Oldenburg; tree and fruit better with A. Peterson.
Charlamoff	6	Flat, r'nd, con'l.	Yel.,red,brown striped	Pleasant acid	Sept.	Russia	6	9	9	10	Much like Oldenberg; said to resist winds better.
Christmas	4	Conical	Gr'nish yel., red strp'd	Sub-acid	Dec.	Russia	7	6	7	10	Fine tree and fruit as grown by A. Peterson, Carver county.
Fameuse (Snow)	4	Flattish, round	Red striped	Sub-acid, good	Nov., Jan.	Canada	9	6	10	5	Was extensively grown in S.E. Minnesota previous to 1885; sub. to scab.
Good Peasant	3	Flat, round	Gr'nish yellow and red	Sub-acid, sweet, aromatic.	Dec., Jan.	Russia	8	6	8	7	A fine fruit; not much grown in Minn.
Haas	5 to 6	Flat, conical	Gr'n, yel., red striped.	Acid	Oct., Nov.		2	8	7	6	Not desirable for any purpose.
Hibernal and Lieby	6	Flat, conical	Gr'n, yel., red striped.	Acid	Oct., Dec.	Russia	2	10	8	10	Hardy, free annual bearer; best for cooking.
Longfield	4	Round, conical	Light yel. and blush	Sl'tly sub-acid	Oct., Nov.	Russia	6	9	7	6	Enormous fruit; fruits young; trees may prove short-lived.
Malinda	4 to 5	Conical	Gr'nish yellow, blush.	Nearly sweet	Jan., Mar.	Vermont	4	5	6	6	Tree slow coming to bearing; best top worked.
McMahon's White	10	Round, conical	Gr'nish yellow, blush.	Pleasant acid	Nov.	Wisconsin	4	10	8	7	Best top worked; grown in S.E. Minn.
Oldenburg (Duchess of Oldenburg)	6	Flat, round	Yellow, red striped	Pleasant acid	Aug.	Russia	4	10	10	10	Most popular summer apple grown in state.
Ostrekoff 4m	4 to 5	Round	Gr'nish yel.,b'wn che'k	Sub-acid	Dec., Jan.	Russia	7	..	6	9	Fine fruit; tree blights on low black soils.
Patten's Greening (Duchess No. 3)	6	Round	Gr'nish yellow, shading faint blush	Pleasant acid	Nov., Dec.	Wisconsin	5	10	8	9	Very promising; free from blight.
Peach (Montreal Peach)	4	Round, ovate	Light yellow	Acid	Aug.		4	9	2	10	Tree good, but slow coming into full bearing.
Perry Russet	5	Flat, r'nd, con'l.	Green russet	Sub-acid	Dec., Feb.		6	10	8	7	Generally shy bearer
Plumb Cider	5	Round, conical	Gr'nish yel.,red strip'd	Sub-acid	Oct	Wisconsin	6	9	8	6	Much grown in S.E. Minn. until 1885.
Red Black	6	Roundish	Gr'nish yel. & brown	Sub-acid	Nov.	Russia				9	Much esteemed by Somerville & Keel.
Roman Stem	4	Round	Yellow russet	Sub-acid	Dec., Feb.		7	8	5	6	Doing fairly well in northern Iowa.

Autumn Streaked...	5	Flat, conical.....	Green, yel.,red striped	Sub-acid	Sept.	Russia ...	7	8	..	9	Blights badly; not desirable.
Scott's Winter.....	4	Round, conical ..	Red striped...	Acid	Feb., Mar.	Vermont .	6	10	8	7	Promising top worked for favorable localities in Wisconsin.
Soiree (Grant Sour).	7	Round.....	Yellow russet.....	Sub-acid	Dec., Jan.	Unknown.	6	8	8	7	Introduced by A. W. Sias; tardy coming to full bearing.
Talman Sweet	5	Round.....	Greenish yellow.	Sweet.....	Dec., Feb.	.....	6	8	6	6	Popular in S.E. Minn. until 1885, when all trees killed.
Tetofsky	4	Flat, conical.....	Yellow, red striped ...	Sub-acid	Aug.	Russia....	6	5	7	9	Slow upright grower; adapted for gardens and small grounds.
Utter.	7	Flat,r'nd.v'rying	Yellow, lt, red striped	Sub-acid	Nov., Dec.	Unknown.	8	7	9	7	Tree subject to canker; should be top worked.
Walbridge'.....	4	Smooth, flat, r'nd	Red striped.....	Sl'tly pl'sant, ac.	Dec., Mar.	.....	6	10	5	6	Inclined to scab; not desirable.
Wealthy.....	6	Flat, round	Red striped or red.....	Sub-acid	Nov., Dec.	Minnesota	8	8	10	7	Very productive; trunks weak.
Yellow and White Transparent.....	5	Round, conical ..	Yel. & greenish yellow	Pleasant, acid ...	Aug.	Russia....	7	7	7	8	Subject to blight; bears young.
SIBERIANS AND HYBRIDS				Quality.							
Beecher's Sweet.....	Med.	Round	Red	Very good.....	Sept.....	America..	5	..	..	7	
Briar Sweet.....	L'rge	Round, conical..	Yellow and red	Very good.....	Sept.....	Wisconsin	6	..	..	8	
Conical.	Med.	Round	Red	Very good.....	Sept.....	America..	5	6	6	9	
Early Strawberry ...	Med.	Conical	Red striped	Good	Aug.	America..	6	6	..	10	
Hyslop	L'rge	Round	Red	Good	Oct.....	America...	..	8	10	8	
Minnesota.....	V.lge	Flattish round...	Yellow and red	Good	Nov.	America..	5	6	6	9	
Orange	Med.	Round	Orange	Good	Nov.	America..	5	7	4	10	
Powers	Sm'll	Flattish round...	Red	Very good..... .	Sept.....	America...	..	10	8	10	
Red Siberian.....	Sm'll	Round	Red	Good	Aug.	Foreign...	..	8	6	10	
Sweet Russet.....	V.lge	Conical	Yellow russet.....	Very good.....	Sept.....	America..	8	..	8	7	Valuable where the larger apples do not succeed.
Tonka	Med.	Flattish round...	Red	Very good..... .	Sept.....	Minnesota	4	10	10	10	Vigorous grower; products will be valuable for this.
Transcendent	L'rge	Flattish round...	Yellow and red..... .	Good	Sept.....	America..	4	10	10	10	Subject to fire blight, but popular.
Whitney.....	V.lge	Round, conical ..	Yellow and red.....	Very good.....	Sept.....	Illinois....	8	5	10	8	Very valuable for elevated localities.
Virginia	L'rge	Flattish round...	Yellow and red strip'd	Very good.....	Sept.....	Russia	4	10	10	10	Valuable as stock for top working.

PLUMS.

Name of Variety.	Description.							Use & V'lue			Remarks.
	Size.	Form.	Color.	Texture of skin.	Flesh.	Flavor.	Stone.	Desert.	Cooking.	Market.	
Cheney	Large.	Round,oblong	Purplish red	Rather thick.	Medium firm.	Nearly sweet	L'ge,flat,cling	8	10	10	Found in Vernon county, Wis.; tree vigorous, upright grower.
Desota	Med.la	Round,oblong	Yel'sh gr'nd, covered with red	Thick	Medium firm.	Sweet	Large, cling..	8	10	9	Found in Vernon county, Wis.; very productive.
Forest Garden	Large.	Round	Yel. mottl'd, covered purp'sh r'd	Medium thick	Soft to med...	Sweet	Cling	8	6	9	
Gaylord	Large.	Round	Moti'd orange & dull red	Medium thick	Md.th'k.juicy	Sweet	Nearly cling .	8	..	10	[tree spready; productive.
Harrison's Peach	Med..	Round,oblong	Dull red	Thick	Medium firm.	Sweet, peachy	Cling	8	..	10	Found wild in Floyd county, Ia.;
Hawkeye	Large.	Round	Purplish red	Thick	Firm	Sweet	Cling	8	..	10	[Minn., by Gen. Le Duc.
Le Duc	Med..	Round, oval..	Orange, mot. red.	Thin	Meaty	Sweet	Half cling....	9	..	9	Found wild in Dakota county,
Ocheeda	Med.la	Round	Mot. yel. and red	Thin	Meaty	Apricot	Half cling....	10	10	10	Found wild at Lake Ocheeda, Nobles county. Minn.
Quaker	Large.	Round,oblong	Orange, red and purple	Acrid, thick..	Firm, juicy...	Sweet	Half cling....	8	..	8	
Rockford	Med.la	Round,oblong	Purple	Thin	Firm	Sweet	Cling	10	8	9	Found in Iowa.
Rollingstone.	Med.la	Round	Mot.pink&purple	Thin	Firm	Sweet	Half cling....	10	8	10	Found wild at Minnesota City.
Weaver	Med.la	R'nd,ob. flat'd	Orange, mot. red	Thick	Firm	Sweet	Free	7	10	8	[Minn.,and introd.byO.M.Lord
Wolf	Large.	Round	Yel., blotch'd red	Thick	Firm	Good	Free	10	..	10	
Wyant	Large.	Round,oblong	Purplish red	Thick	Firm	Good	Free	..	..	..	
Black Hawk	Large.	Round,oblong		Thin	Firm	Good	Free	..	10	..	
Maquoketa	Med.la	Round,oblong	Red	Thick	Firm	Good	Cling	..	10	..	

CURRANTS AND GOOSEBERRIES.

Currants. Name of Variety.	Description. Size.	Bunch.	Color.	Flavor.	Season.	Origin.	Use & V'lue. Desert.	Kitchen.	Market.	Remarks.
Cherry	Very large	Short	Red	Very acid	Medium	Foreign	6	10	10	Strong grower; not sufficiently productive for profit.
Fay	Large	Long	Red	Med. acid	Medium	America	7	10	10	Very productive; not adapted for prairie regions.
Long Branch Holland	Medium	Very long	Red	Very acid	Late	Foreign	4	10	10	Very late; productive; fruit hangs on well.
North Star	Large	Long	Red	Med. acid		America	7	10	10	Strong grower; hardy and productive.
Prince Albert	Large	Long	Red	Acid	Late	Foreign	6	8	10	Strong grower.
Stewart	Medium large	Long	Red	Med. acid	Medium	Minnesota	7	10	10	Strong grower; productive.
Red Dutch	Large	Very long	Red	Acid	Late	Foreign	6	10	10	A good market sort.
White Grape	Medium	Medium	White.	Med. acid	Early	Foreign	8	6	8	Bush straggling; valuable in small quantities.
Victoria	Medium	Medium	White.	Med. acid	Early	Foreign	8	6	8	Bush better than White Dutch; scarcely as productive.
White Dutch	Medium	Med. long	Red	Acid	Early	Foreign	8	10	8	With good cultivation does well everywhere.
Black Naples	Large	Medium	Black.	Med. acid	Medium	Foreign	..	10	..	The best black currant for general cultivation.
Black English	Medium	Short	Black.	Med. acid	Medium	Foreign	..	8	..	
Crandall	Large	Long	Bluish black	Med. acid		America	..	..	..	

Gooseberries. Name of Variety.	Description. Size.	Form.	Color.	Quality.	Season.	Origin.	Use & Value. Kitchen.	Market.	Remarks.
Downing	Medium large	Round oval	Light green	Very good	Medium late	America	10	...	Very promsing; should have winter protection.
Houghton	Medium	Round oval	Pale red	Good	Early	America	10	10	The standard variety for Minnesota; very productive.
Industry	Very large	Round oval	Red	Very good	Medium	Foreign	...	10	Tender and mildews badly.
Pale Red (Am. S'edl'g)	Medium	Round oval	Red	Very good	Early	America	10	9	Bush more upright than Houghton.
Smith	Large	Oval	Greenish green	Very good	Medium	America	....	10	Promsing well; is better for having winter protection.
Triumph	Very large	Oval	Pale green	Very good	Medium	America	.. .	....	A new variety of great promise.

BLACKBERRIES.

Name of Variety.	Description.						Use & Value.		Remarks.
	Size.	Form.	Color.	Quality.	Season.	Origin.	Home.	Market.	
Agawam	Medium	Round, oval	Black.	Very good	Medium	America.	10	8	Not much known in the West.
Ancient Briton	Large	Oblong, oval	Black.	Very good	Medium	America.	9	10	The great commercial favorite of the West.
Dorchester	Medium	Obl., conical	Black.	Bad	Medium	America.	10	7	Not much grown.
Early Harvest	Medium	Oval	Black.	Good	Very early	America.	8	6	Not productive in Minnesota.
Kittatinny	Very large	Oblong, oval	Black.	Bad	Medium late.	America.	9	10	Popular in market; not productive.
Snyder	Medium	Round, oval	Black.	Very good	Early	America.	8	8	The most valuable early variety; nearly hardy.
Stone's Hardy	Medium	Oblong	Black.	Good	Medium late.	America.	8	8	Popular in some localities; appears to be two varieties under the name.
Wilson Jun.	Large	Oblong, oval	Black.	Very good	Very early	America.	8	10	Often fails to pollenize; not profitable.
Minnewasca	Medium	Round, oval	Black.	Very good	Early	America.	9	....	New; promises well.
Dewberry, Lucretia.	Large	Round, oval	Black.	Good	Early	America.	10	10	Valuable where it fruits well.
Dewberry, Windom.	Medium	Round, oval	Black.	Very good	Early	America.	10	7	Has done well in western Minnesota.

RASPBERRIES.

Name of Variety.	Description.						Use & V'lue			Remarks.
	Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Kitchen.	Market.	
Red.—										
Brandy wine	Medium	Ro'nd, con	Bright red	Good	Medium	America	5	8	8	Firmness and bright color make it a good shipper.
Cuthbert	Large	Round, ov	Red	Very good	Late	America	10	10	10	Strong, vigorous grower; best all purpose berry.
Thompson Prolific	Large	Round	Red		Early	America	..	..	..	Now said to be healthy and hardy and very early.
Golden Queen	Large	Ro'nd, con	Yellow	Very good	Medium	America	8	..	5	Only valuable for home garden.
Gladstone	Medium	Round	Dark red		Early & late	America	5	..	0	Only valuable as a novelty and to feed birds.
Hansel	Medium	Ro'nd, con	Bright red	Very good	Very early	America	10		8	
Marlboro	Large	Ro'nd, con	Red	Good	Medium early	America	8	10	8	Canes dwarf; fruit of fine appearance for market.
Turner	Small	Round	Red	Very good	Early		10	..	8	Hardy and medium productive; best in quality.
Regal Church	Large	Round	Bright red	Good			..	..	..	C. A. Green, of N. Y., is booming this variety.
Japanese (Wineberry)	Medium	Round	Dark red		Late	Foreign	0	5	0	Very tender and of no special value except for ornament.
Blackcap.—										
American or Doolittle	Medium	Round	Black	Very good	Medium	America	8	8	8	Getting badly mixed or run out.
Carmer	Large	Round	Jet black	Very good	Early	America	8	8	9	New early variety.
Earhart	Large	Round	Black	Good	Early & late	America	7	8	8	The best of the early bearing; not profitable for market.
Gregg	V'ry large	Round	Black	Good	Late	America	6	8	10	Strong growers; tender; needs winter protection.
Hillbom	Large	Round	Black	Very good	Medium	America	10	8	8	One of the best second early.
Nemaha	V'ry large	Round	Black	Very good	Late	America	7	10	10	Hardier than Gregg and as good in every other respect.
Kansas	V'ry large	Round	Black	Very good	Early	America	10	10	10	
Ohio	Med. large	Round	Black	Good	Medium late	America	7	8	8	Hardy; strong grower; productive.
Palmer	Medium	Round	Black	Very good	Early	America	8	8	10	Valuable market berry; ripens whole crop in short time.
Tyler	Medium	Round	Black	Very good	Early	America	8	8	8	Plant free from rust; moderately productive.
Shaffer	V'ry large	Round	Purple	Good	Medium	America	8	10	8	Supposed to be a hybrid; very productive.

STRAWBERRIES.

Name of Variety.	Description.						Use and Value.				Remarks.
	Sex	Size.	Form.	Color.	Firmness.	Season.	Production	Dessert.	Market.	Shipping.	
Bidwell	B.	Very large	Conical	Bright scarlet	Firm	Medium	5	..	..	..	
Bubach, No. 5	P.	Very large	Obtuse, conical	Bright scarlet	Medium soft.	Medium	8	..	..	..	
Captain Jack	B.	Large	Round, conical	Dark red	Firm	Medium late.	6	..	..	..	
Champion, (Windsor Chief.)	P.	Large	Roundish	Dark crimson	Medium	Late	7	..	..	..	
Charles Downing	B.	Large	Conical	Deep scarlet	Medium firm.	Medium	6	10	..	..	
Crawford	B.	Large	Obtuse, conical	Bright crimson	Medium	Medium	..	..	..	..	
Crescent	P.	Very large	Roundish conical	Bright scarlet	Soft, medium	Medium e'rly	10	7	9	6	
Cumberland	B.	Very large	Roundish conical	Bright scarlet	Soft	Medium	..	..	..	..	
Downer, (Downer's Prolific.)	B.	Medium	Roundish conical	Bright scarlet	Soft	Early	9	9	8	5	
Eureka	P.	Large	Roundish	Bright red	Medium soft.	Medium late.	8	8	10	.	
Gandy	B.	Large	Conical	Bright red	Firm	Late	..	..	10	10	
Glendale	B.	Large	Roundish conical	Bright red	Firm	Late	6	..	9	10	
Haverland	P.	Large	Long conical	Reddish scarlet crimson	Soft, medium	Medium	10	8	10	0	
Jersey Queen	P.	Very large	Roundish conical	Bright scarlet	Firm	Late	8	10	10	10	[not generally profitable.
Jessie	B.	Very large	Roundish conical	Bright scarlet	Medium	Medium	5	8	10	6	Variable on different soils;
Hart's Minnesota	B.	Medium large	Roundish	Crimson	Firm	Early	7	10	10	9	
Lovett's Early	B.						..	..	..	..	
Martha	P.	Medium large	Obtuse, conical	Dark scarlet	Firm	Medium late.	8	8	10	10	
Manchester	P.	Large	Obtuse, conical.	Scarlet	Soft	Medium late.	8	4	6	0	
Michel's Early	B.	Medium	Roundish conical	Scarlet	Medium firm	Early	7	8	8	..	
Mrs. Cleveland	P.	Large	Roundish conical	Bright scarlet	Medium	Medium	..	..	..	..	
Parker Earle	B.	Medium large	Long conical	Bright red	Firm	Late	8	9	..	..	
Pearl	B.	Medium	Obtuse, conical	Dark red	Firm	Medium	..	..	..	..	
Sandoval	B.	Medium large	Roundish conical	Deep red	Firm	Medium e'rly	..	..	..	..	
Shuster's Gem	P.	Large	Round, conical	Scarlet	Medium	Medium	..	..	..	..	
Stayman, No. 1	P.	Large	Obtuse, conical				..	..	..	..	
Warfield	P	Medium large	Roundish conical	Deep red	Firm	Medium e'rly	10	8	10	10	
Wilson	B.	Large	Roundish conical	Dark crimson	Firm	Early	..	6	10	10	Uncertain in yield.
Rio	B.	Medium large	Round	Bright red	Firm	Early	..	..	..	..	
Van Deman	B.	Medium large	Roundish conical	Dark red	Firm	Early	..	..	..	..	[mature berry.
Princess	P.	Very large	Roundish	Bright scarlet	Soft	Medium	10	10	7	0	Vigorous plant; valuable; a

GRAPES.

Name of Variety.	Description.						Use & Value.		Remarks.
	Size.	Form.		Color.	Season.	Origin.	Table.	Market.	
		Bunch.	Berry.						
Agawam (Rogers 15)	Large		Round	Red	Medium	Hybrid	9	8	
Barry (Rogers 43)	Large		Round	Blue	Medium	Hybrid	6	8	
Brighton	Large		Round	Bluish red	Early	Labr	9	10	
Champion	Large		Round	Blue	Early	Labr	2	6	
Clinton	Small		Round	Blue	Late	Ripa	3	3	
Concord	Large		Round	Blue	Medium	Labr	7	10	
Cottage	Large		Round	Blue	Early	Labr	5	5	
Delaware	Small		Round	Red	Early	?	10	10	
Duchess	Medium		Round	White	Late	Hybrid	10	8	[will ripen.
Early Victor	Medium		Round	Blue	Early	Labr	6	4	Desirable where only the earliest varieties
Empire State	Medium		Round, oval	White	Late	Lab., Rip	4	4	Does not seem adapted to Minnesota.
Herbert	Large		Round	Blue	Medium	Hybrid	8	8	[ripening here.
Iona	Medium large		Round, oval	Red	Late	Labr	8	6	A vigorous, productive variety; seldom
Janesville	Medium		Round	Blue	Early	Lab., Rip	2	5	Worthless where better grapes can be grown.
Lady	Large		Round	White	Early	Labr	8	5	Vine not vigorous.
Lindley (Rogers 9)	Medium		Round	Red	Early	Hybrid	10	9	Fruit drops badly from bunch.
Massasoit (Rogers 3)	Large		Round, oval	Red	Early	Hybrid	7	5	
Martha	Medium large		Round	White	Medium	Labr	6	5	Vine quite hardy and productive.
Merrimac (Rogers 19)	Large		Round	Blue	Late	Hybrid	6	6	
Medford Prolific	Medium large		Round	Bronze	Early	Labr	...	...	[fruiter.
Moore's Early	Large		Round	Blue	Early	Labr	8	10	A good and hardly early grape; rather shy
Moore's Diamond	Medium		Round	White	Early		8	8	
Moyer	Small		Round	Red	Early		7	4	
Niagara	Large		Round, oval	White	Medium late	Labr	8	9	
Pocklington	Large		Round	White	Medium	Labr	8	7	
Salem (Rogers 22)	Medium large		Round	Red	Medium	Hybrid	7	7	
Wilder (Rogers 4)	Large		Round	Blue	Medium	Hybrid	7	8	[ity.
Worden	Large		Round	Blue	Medium early	Labr	8	9	Better than Concord; increasing in popular-
Woodruff Red	Large		Round	Red		Labr	....	....	
Wyoming Red							...	...	
Early Ohio	Medium large		Round	Blue	Very early	Labr	8	10	

FRUIT BLOSSOMS.

REPORT OF COMMITTEE ON FRUIT BLOSSOMS.

C. W. H. HEIDEMAN, NEW ULM.

The season of 1892 was an extraordinary one, particularly the spring and early summer.

The writer with the assistance of Mr. O. M. Lord of Minnesota City had mapped out a series of observations on fruit blossoms, especially those of our native plums, but owing to the backwardness of the season all of the data obtained early in the season had to be abandoned later, as far as enabling us to draw the conclusions desired from a series of observations under favorable circumstances.

A few bright days in April gave vegetation a start; plum blossoms began to swell, and in a few days had nearly arrived at the opening or bursting period; cold cloudy weather set in and continued steadily for 5 or 6 weeks, with scarcely a bright warm day in the interval.

Plum blossoms that in 1891 opened from May 3rd to 10th, this year, ready to open upon the advent of one or two bright warm days, did not open generally until May 24th to June 5th, and at that time the weather, though warmer, was cloudy and damp.

Juneberries in 1891 were in full bloom May 1st, and although quite severe frosts were recorded almost every night from April 29th to May 5th the days were bright and warm; the blossoms set fruit freely. This year, 1892, Juneberries under about the same conditions as plums bloomed May 24th to June 1st and set no fruit at all. During 1892 plums, cherries, sand cherries, bird cherries, Juneberries and other fruits bloomed from May 24th to June 5th, while heretofore a difference of at least 10 to 15 days has been observed in the period of blooming.

About 20 varieties of grapes observed were at least 15 days later in leaving out and about a week later in blooming.

Examination of plum blossoms during May showed weak and aborted organs, with but very little pollen, and that washing away by rains. The blossoms continued a longer period, and those that set fruit soon aborted and dropped. Even by protection of the blossoms and hand pollination, about 80 per cent of my recorded crosses failed in setting or maturing fruits, and these did not reach full size. The organs of reproduction had evidently become vitally weakened by their long wait in a semi-dormant state. Cherry blossoms, on the contrary, did not begin to swell until about May 20th, were in full bloom between May 25th and 31st, and set and matured a good crop of fruit.

DISCUSSION.

President Underwood: The subject is now before you for discussion. This paper have been very interesting, and I hope the members will discuss it thoroughly.

Mr. Allyn: It has bothered me a good deal of late to know why we have such a bountiful bloom in plums, apples, etc., and such a scarcity of fruit. This last year I noticed that the trees bore this bloom very bountifully, and, yet, a great many of them were very barren. I suppose the pollen is destroyed by the wet weather. I would like to learn whether that is the real reason.

Mr. Brackett: The wet weather washes the pollen on to the ground so that the wind does not carry it.

Mr. Heideman: I believe, as I stated in my paper, that the conditions were these: We had a few very bright days in April that started the plum blossoms until they were almost ready to open. Cold weather then set in. It was cold, chilly and damp and, while the plums should have been in bloom ordinarily as early as the 15th of May, the blossoms were held back by lack of warmth and sunshine and did not bloom until the 1st of June. Now, the bloom is a very delicate institution. Of course, in winter it is wrapped up in the bud and lies in a dormant state, and can thus endure a great deal of hardship and change of climate, but when it has been started and the processes of assimilation have set in and the real chemical work has begun, it is very easily injured. The weather this spring was cloudy and rainy for a long time, and, of course, if it continues cloudy and rainy for a long while the organs of reproduction will be so weakened that it will be entirely out of the question for them to perform their functions.

Mr. Murray: My own observation was that on account of the cold weather there was not as good a pollenization as there should have been. The pollen that did form was largely washed out by the enormous rainfall.

Mr. Urie: Being a bee-keeper, I have observed that when we have a good crop of fruit the weather is generally such that the bees can visit the blossoms. When we have such a year as last year, with such weather as we had, the bees cannot visit the blooms. The result is generally a poor crop of fruit. I believe that bees are the finest things that the horticulturists can have near their orchards. I have observed that for the last thirty or forty years. In Illinois, where I came

from ten years ago, we had around us a large number of pear orchards, and when the weather was such that the bees could not get out of their hives, we raised scarcely any pears, but when the weather was fine, we always got a good crop. I think that is one reason why our fruits failed this year.

FRUIT BLOSSOMS.

L. H. WILCOX, HASTINGS.

In reporting upon fruit blossoms, allow me to depart from the usual formula and call attention to the possibilities of beneficient results clearly within our reach.

While thousands of experimental tyros, with no proper conception of the Creator's plan of life are working by crude and unscientific methods to attain useful improvements in our various fruits, how few are taking advantage of the ascertained facts of botanical knowledge to develop the desirable and eliminate the undesirable characteristics of fruit by proper selection and treatment of the blossoms, the reproductive organs of plant life! That like produces like is a generally recognized law of nature, but this is usually varied in individual forms by the composite character of their ancestry, and variations are most readily produced in form, quality and all the distinguishing attributes of plant life in kindred species by proper use of pollen from the blossoms. If close bred, the variations will be within comparatively narrow limits, and by judicious selection of parents good qualities may be fixed and retained in their progeny. If cross-fertilized by other varieties possessing different habits of growth and quality of fruit, we can always safely assume that the progeny will closely follow the female plant in constitution and vigor, while the influence of the male will predominate in form, size and characteristics of fruit.

If fruit blossoms are pollenized from kindred species of the same family of plants, true hybrids may be produced of great constitutional vigor, but the lines of variation with these are quite uncertain and have not been well established, except in one or two sub-orders. God provides against unlimited multiplication of species in a state of nature by rendering the blossoms of most hybrids impotent, so we may encounter greater difficulties with those in the second than the first generation. Fixity in reproduction may be secured by repeated crosses with the better established parent varieties, when it can be done, and thus artificial species created of possible utility to mankind.

Nature provides by most beautiful adjusted and elaborate arrangements for the cross-fertilization of flowers, and each species has its own peculiar adaptation of blossoms for this purpose. Some float large quantities of pollen grains upon the air, while others use the bees and insects to carry their love to distant flowers; and what is still more essential in the attainment of this object, most bi-sexual fruit blossoms discharge their pollen either before or after the stigma of that particular blossom is in a condition to receive it. Grey says there must be some essential advantage in cross-fertilization, or cross-breeding, otherwise all these various

elaborate and exquisitely adjusted adaptations would be aimless. Doubtless the advantage is the same as that which is realized in all the higher animals by the distinction of sexes. Man by intelligent study of its processes may so modify the workings of nature as to secure results adapted to his own use. While nature provides for the survival of the fittest to perpetuate the species, man may provide for the survival of those best fitted to contribute to his own wants and enjoyment. By utilizing our knowledge of the various attributes of the blossoms and the most common lines of variation, we may breed with a certainty of success to almost any desirable degree of excellence of fruit or hardiness of plants, as has been done with our improved breeds of horses and cattle. The same fundamental laws of heredity govern all plant, animal and human life, and when I see plants assisting nature's designs by voluntary action of their own, I cannot help but feel that those attributes of existence, or qualities of mind, called reason in man and instinct in animals, may be found extending in less degree throughout all forms of vegetable or plant life. The soul sleeps in plants, dreams in animals and awakes to life in man.

The great success attending the work of Von Mons shows what may be done in the development of fine quality by selection and close breeding alone, but his trees and others produced in a like manner were generally lacking in hardiness, and as they displaced the poorer natives they have given the pear a reputation for tenderness, which it should not possess. If he had understood the art of hybridizing and crossing, as we do today, he would have, undoubtedly, improved their hardiness as well as quality of fruit. But their hardiness is not necessary in France, while it is the first requisite here.

Without alluding to the details of many individual experiments, we have established by means of the blossoms two fundamental principles of variation, by means of which we may secure what we need for the great Northwest, viz: The constitutional vigor, hardiness and climate-proof properties of inferior varieties, combined with the useful qualities of superior fruits. These two basic principles are: First.—The ability to secure by cross-breeding varieties more hardy than the female parent combined with the useful qualities of the male. Second.—The ability to fix desirable characteristics by close crosses with like bred varieties possessing similar attributes. The female parent variety should always possess to a marked degree healthy, hardy habits of growth, and with small fruits, especially, a large well-developed root system. The pistillate are usually more liberally endowed with these qualities as well as more productive than their bi-sexual kindred; the staminate parent should not be deficient in these, while excelling in size and quality of fruit. We should use careful observation in the selection of individual blossoms and plants, or our efforts for improvement may result in perpetuating defects, which sometimes seem more easy to transmit than the virtues which we seek to secure. It is not the true fruit, the seed, that we need to develop, but its fleshy surroundings, the thickened corolla, the enlarged torus of the selected blossom and the size and length of the fruit stem: These should receive careful attention, as they all serve to modify results.

In conclusion, let me say, from my own experience with small fruit, I fully believe the time has come when the blossoms will act as a compass to our apple growers and point the way to the production of those hardy, long-keeping varieties of winter apples, which we all desire.

EXPERIMENT STATIONS.

REPORT OF CENTRAL STATION.

PROF. S. B. GREEN, ST. ANTHONY PARK.

It is a little too early to look for the best results from the reorganization of our experiment stations. I think the work done and being done shows, however, the wisdom of your action of two years ago, by which the present superintendents of the experiment stations were selected. The work already accomplished here is all that could be expected in so short a time Considerable material for experiment purposes was sent out to the different stations last spring, and I think all of them received the material asked for by the superintendents as nearly as it was practicable to furnish it. In bulletin No. 25 of this station, published in December last, was included reports on small fruits from those sub-stations especially working on these lines. It is my intention to increase the representation of the work of the sub-stations in the bulletins of the central station, as their work increases in value and as opportunity may offer. Reports from these stations are submitted herewith and they speak for themselves of the great value of the work they are all doing.

PUBLICATIONS.

The publications of this division for the time covered by this report are as follows: Bulletin No. 24, issued in October, 1892, consists of 64 pages, and is a report on the behavior of the ornamental and timber trees, shrubs and herbaceous plants offered by the most progressive nurserymen that have been tried in this state. This bulletin contains a table of hardiness in which the different plants mentioned are, as far as possible, criticised by reliable observers in various parts of the state. It is designed, especially, as a guide to planters in this state, and furnishes a satisfactory answer to the many requests this division has received for information of this character. Bulletin No. 25, issued in December, 1892, consists of a report on varieties of strawberries, raspberries, blackberries, dewberries and grapes fruited at the station the past year; a report on a preliminary experiment in shading strawberry plants to increase their fruitfulness; on renewing old strawberry beds; on the details of a very successful experiment in the spraying of grape vines to prevent downy mildew, and of reports from our sub-stations on small fruit.

APPLES.

The experiment orchards at the station are in excellent condition and produced a small amount of very excellent fruit the past season for the first time, but they are not yet old enough to warrant me in drawing conclusions from the results. The number of varieties on trial has been increased by the addition of promising seedlings and Russian, Swedish and

North German apples, until now we have about 300 varieties. It is my object to thin out this large list and reduce it to reasonable proportions as soon as may be.

There was considerable root-killing in some locations last winter, and last summer blight was very severe and thinned out some varieties very severely; but I look upon its apearance as a positive benefit to experimental horticulture, for it has indicated the great resistant qualities of a few varieties while it has shown the absolute worthlessness of many kinds. A few varieties have stood up fresh and green all summer, while close to them other varieties, perhaps, blighted to death. A few of the kinds that have most successfully resisted the work of the blight are Duchess, Anisim, Lieby, Red Wine, Breskovka (152 m) and Borovinka. The Lieby had a very little blight on the ends of a few twigs, the others mentioned were not at all affected. The variety referred to as Anisim is the same as that formerly exhibited here as Good Peasant. It is an early winter apple of extra fine quality. I regard it as one of the most promising kinds that has been tried in this state. The tree is one of the hardiest. Breskovka (152 m) is very much like the Yellow Transparent in season, size, color and productiveness, but while the Yellow Transparent is killed by blight the Breskovka seems to be proof against it. I regard it as a very valuable kind.

TOP-WORKING APPLES.

The subject of top-working somewhat tender varieties of apples on hardy stocks is one that is exciting among orchardists much interest in this state, and some results already achieved in this line seem to indicate that by this plan varieties of no greater hardiness than the Wealthy may be grown much farther north than at present seems practicable. One of the best stocks for top-working is the Virginia crab, and last spring I planted fifty of them for this purpose.

SEEDLING APPLES.

In my report last year I referred to the importance of experimenting with seedlings from some of the best varieties of apples. I have grown the season just past 900 plants from seed of the most hardy desirable known varieties of apples. While this is a promising field for experiment, yet with these seedlings we know only the maternal parent, and, of course, the work is made more a matter of chance than it would be did we know both parents. With the object of doing better work, I last spring made hand crosses of the following hardy kinds of apples with the Lieby, using the latter as the mother plant: Duchess of Oldenburgh, Christmas, Good Peasant, Borovinka and Charlamoff. This work may be compared to the systematic, intelligent breeding of domestic animals, and from these crossed seeds I expect much better results than from ordinary seedlings.

PLUMS.

The outlook for improvement in this fruit is very encouraging. We have now forty-seven named varieties on trial, and are making a specialty of raising seedlings from the best kinds, and have now over four thousand plum seedlings, from which we expect to select at least two hundred promising plants for fruiting. The large trees in the orchard have borne regularly very heavy crops of fruit until this year, when they blossomed profusely but the pollen was washed away by heavy rains and the crop was a total failure.

REPORT ON STRAWBERRIES.

The strawberry crop was a fair one and prices were higher than for several years. The young plantations are in the best of condition for a good crop next year. The leaf blight was very destructive to some varieties, notably to the well known Captain Jack, which has been very generally a failure from this disease. Our experience at the experiment station goes to show that while it is possible to keep most varieties healthy by the use of Bordeaux mixture and other fungicides, yet it is much better to plant varieties that resist this disease. However, the increasing difficulty of getting satisfactory pollen producers may soon force us to use the Bordeaux mixture on these kinds. It is very certain that only healthy varieties can produce paying crops of fruit, and while the health and productiveness of varieties of the strawberry varies much in different locations, yet some varieties do remarkably well over a large area and in almost any location or soil.

The strawberries at the experiment station are on open clay land having a gentle slope to the south, and are grown in the matted row system. The runners are allowed to root until the row is well filled, and any that start afterward are cut off. It is our practice to fruit strawberry beds a second time, if they are in good condition when the first crop is gathered, and this year most varieties have proved more prolific on the old beds than on the new. In renewing old strawberry beds the following plan is pursued:

RENEWING OLD STRAWBERRY BEDS.

As soon as may be after the crop is gathered, the bed is closely mowed and all the weeds and strawberry leaves are burned. A plow is then run on each side of a matted row, and all but about one foot in width of it is turned under. The furrows thus made are filled with fine rotted manure and the cultivator set going.* The plants remaining are then thinned out with a hoe, and special pains taken to cut out all weeds and old or weak plants. This leaves the old bed clean, with plenty of manure close by, in which the old plants can make new roots. The plants soon send up new leaves which are much healthier than they would be were the old foliage allowed to remain, and if we have an ordinary season an abundance of runners will be sent out, and by winter the old bed will look nearly as vigorous as a new one. At the time of this writing we have an old bed of various kinds that has borne two crops, which we cleaned up in July for a third, and it is very difficult to find on it a single diseased leaf among the several varieties with which it is planted, and the rows are full of green, vigorous plants and runners.

SHADING STRAWBERRY BEDS.

Many complaints have reached us of the difficulty of securing a good crop of strawberries in exposed places on the prairies, even when the plants had grown well and both staminate and pistillate kinds were planted. This trouble is probably due to the pollen being too much dissipated by the wind, and, perhaps, also, to the drying up of the fruit after it is set by the hot sun and winds. With the object of finding a remedy for this trouble some preliminary experiments have been undertaken, in one of

*We sometimes find it necessary to take out all but the two outside cultivator teeth if the mulch is very thick.

which a part of the strawberry bed, including mostly plants of a late variety, named Parker Earle, was shaded with a brush screen such as we use for protecting evergreen seedlings. The result was the plants under the screen matured all the fruit, while on those not thus shaded many berries were sun-scalded and many others failed to ripen. In the first case, we had a full crop; in the second, perhaps, one-half. This is confirmatory though not by any means conclusive data, on which to recommend this practice to those wishing to grow strawberries in very exposed places. But it would seem, however, a very rational suggestion, when we remember that, generally, the best fruit and, certainly, the best late fruit of strawberries is found in the wild state in locations somewhat protected and shaded, and that in such places the foliage is seldom affected with fungous diseases. The past season was in point of moisture an exceptional one and not the best in which to make this trial.

A good screen for this purpose is made by setting posts with natural crotches at one end, connected together by poles and covered with willow or other brush sufficient to give a play of light and shadow on the bed, but not enough to keep out more than half the sunlight. I think it would be well to have such a bed in a somewhat protected location. Such treatment might not be practicable on a large scale, but it is so very inexpensive and simple that it is well worth trying in a small way in the home garden. We shall report further on the matter when we have more fully investigated it, and make this simply as a report of progress and as a suggestion to fruit growers.

SEEDLING STRAWBERRIES.

For fruiting next year we have a fine lot of about seven hundred seedling plants from which we have kept the runners off, and they are very promising indeed; they are seedlings of Warfield and Haverland, fertilized with Michel's Early.

From seed sown this year we have over two thousand plants pricked out in frames, which we expect will be in excellent condition to plant out next spring. These are the result of carefully made crosses between our most prolific kinds.

NOTES ON NEW VARIETIES OF STRAWBERRIES.

Especially desirable kinds are starred.

Bederwood. (b)** A very promising new berry that has done remarkably well with us this season. It is bi-sexual, has lots of pollen, and I think it well worth trying as a pollenizer and for market. Its foliage is only slightly affected with rust.

Bubach. (p) Gave us a few magnificent berries, but not enough to make a profitable crop.

Boynton. (p) Is a red berry of about the size and with much the appearance of the Crescent, but apparently no better.

Crescent. (p)** This old standard variety has done very well this season. In our old bed it produced a far larger crop than in the new bed, but it did not do nearly as well as the Warfield, which I think is generally superseding it.

Captain Jack. (b)* Was nearly ruined by rust.

Great Pacific. (b) I am somewhat disappointed in this variety. Some of the fruit is large, but much of it is small and irregular in shape and rather inclined to rust.

Haverland. (p)*** Has done much better than last year, and was in many ways our best berry. The foliage is healthy and the berries are elegant. It produced rather more fruit this year than the Warfield.

Jessie. (b) Was nearly a failure with us this year, as well as at some of our trial stations. I regard it as a very uncertain kind and think there is a weakness in the blossoms that makes it peculiarly susceptible to injury from winds, frosts and heavy rains.

Michel's Early. (b)* I think well of this variety as a pollen producer, but it does not produce much fruit and has not been as productive this year as last. Yet its fruit this year was rather larger and better in quality than last. I mean to continue using it as a pollen producer. It is a vigorous grower and free from rust.

Little's No. 7. (b) From John Little, Granton, Ont. Is one of the most striking in foliage and fruit of all that have come to my notice for several years. The foliage is tall, dark green and very healthy. The fruit is long, large and firm, on long peduncles. Very productive and a promising late fruit.

Little's No. 9. (p) Also from John Little. Is a very productive and promising variety of large size.

Little's Seedling No. 37. (p) Resembles the Warfield very much, but it is not quite as early and is somewhat sweeter. Very productive and promising.

Lovett's Early. (b) Is a berry of good color, form and substance, but not sufficiently productive to be profitable.

Enhance. (b) Has produced some very good fruit on August set plants, but needs another season's trial to thoroughly test it. Promising.

Oregon Everbearing. Whatever everbearing qualities it may once have had, it does not show them here, and I rather doubt whether it ever bore over any number of consecutive seasons more than one crop a year. Not desirable.

Parker Earle. (b) Is about ten days behind the Warfield. It has a great lot of green fruit, but during the hot weather much of it fails to ripen satisfactorily. This year a part of the space devoted to it was shaded, with the result that the portion so treated produced a fine crop of fruit while the rest gave a very light crop after the first picking. Plant very healthy and vigorous, but it does not make many runners.

Princess. (p) Seems to be doing better in the hands of its originators and elsewhere, than with us. I regard it as generally a profitable berry for the near market. It is of large size and fine color but rather soft.

Pearl. (b) A beautiful bright red berry that did poorly with us last year, but this year is very productive.

Schuster's Gem. (p) Did remarkably well with us last year, but not so well this. It is of good size and worthy of further trial.

Saunders. (b) Did very well with us last year, but this season seems much inclined to rust.

Warfield. (p)*** The most popular berry grown, and it is fast supplanting the Crescent in this state. It is a better shipping and selling berry than the Haverland. Our customers especially like it for canning purposes.

List of new varieties planted the spring of 1892:

Accomack.	Beverly.	Swindle.
Edgar Queen.	Waldron.	Southard.
Standard.	Putnam.	Stevens.
Gillespie.	Westlawn.	Williams.
Muskingum.	Auburn.	Dayton.
Noble.	E. P. Roe.	Mark.
Leader.	Gem.	Waupon.
Ona.	Oscar.	Sandova.

RASPBERRIES.

The raspberry crop has been a very profitable one this season. Almost every variety has given good returns. Many plantations of red raspberries are affected with the disease commonly called "leaf curl," and it is becoming a very serious matter in many places, where it is spreading slowly but surely. No remedy is known for the disease, but the best treatment for it seems to be the digging out and burning of all affected plants. In starting a new bed, it should be only on new land, and great care should be taken to use only healthy plants.

SEEDLING RASPBERRIES.

About five hundred seedlings of Schaffer's Colossal fruited this year for the first time. The fruit resembles very closely that of the parent plant, and a number of seedlings appeared fully as valuable as that of the Schaffer. Fifty of these were selected as being worthy of further trial. It is a point of special interest that the seedlings of this variety, which is generally termed a hybrid, should be so uniform and show so much of a fixed type. Three hundred seedlings of Souhegan and Cuthbert were raised the past year.

NOTES ON SOME OF THE NEW RASPBERRIES.

Gladstone. Grows vigorously and produces a little fruit until frost, but what little fruit it does produce is so small and soft as to make it almost worthless either for home use or for market.

*Golden Queen.*** Continues to be the favorite yellow kind. Its fruit is large and firm. With the exception of color, practically indentical with Cuthbert.

*Hansell.** A very early kind that is becoming quite a favorite. It is a rather weak grower except on rich soils, and until well established it needs high cultivation.

Superlative. A new variety sent out by Ellwanger & Barry of Rochester, New York, at six dollars ($6) per dozen in 1892. Fruit on spring set plants very large but crumbly and of poor quality. Foliage and cane of the Antwerp type.

Champlain. Similar to the above in foliage and cane, but has not fruited here.

BLACK CAP RASPBRRIES.—(*Rubus Occidentalis.*)

Kansas. A very vigorous and productive variety from Kansas. Fruit large, of fine appearance and very promising.

Lovett, or ($1000). Will probably prove to be a desirable addition to our list of second early kinds. The fruit is as large as the Gregg, and it is several days earlier. Foliage and cane quite distinct.

Mystery. Sent out from Kentucky as an everbearing kind. It bears but one crop here.

*Nemaha.**** Is without doubt somewhat hardier than the Gregg and so much like it in fruit as to be practically the same thing for marketing purposes.

Older. We have not fruited this variety, but reports on its behavior elsewhere convince me that it is well worthy of trial by berry growers. Season about with the Ohio.

JAPAN RASPBERRIES.—(*Rubus Japonica.*)

Japan Wineberry. This berry has been greatly misrepresented and is giving very general disappointment where tried. It is interesting to botanists and may be useful in hybridization, but for fruit production it is practically worthless. The berry is small, of poor color and enclosed in a husk like a ground tomato.

Varieties of raspberries planted at experiment station in 1892:

Thompson's Early Prolific. Superlative.
Brackett's Seedling, 101.
Champlain. Older. Ada.

NOTES ON NEW VARIETIES OF BLACKBERRIES.

Jewett is a new blackberry received from the J. C. Lovett & Co., Little Silver, N. J., in 1890. It killed with us the first year, although well protected with soil.

El Dorado is a new blackberry that we received from Greenville, Ohio, in 1891. It was quite prolific this season, of good large fruit. A promising kind.

NOTES ON NEW VARIETIES OF GRAPES.

Centennial. A very productive white variety of moderate or poor growth. Bunches are of fair size and very compact. The berry is white, small; seeds large; of good quality; skin tough. There are several more satisfactory white varieties. Ripens with Concord.

Green Mountain. A new grape that we fruited this year for the first time. The vine is vigorous, healthy, apparently hardy enough for our conditions, and I think very prolific. The bunches are of good size; the berry is pale green, medium in size, very sweet and melting, with thin skin. It ripens earlier than any other variety of as good quality that we have. It drops from the bunch as soon as well ripened, which, with its green color, will prevent its being largely planted as a market variety. I think highly of it for the home garden in this state, and recommend it for trial.

Moore's Diamond. A very distinct new white grape that is very promising. The vine is vigorous, healthy and productive. Bunches compact, shouldered, large; berries large; skin thick; flesh tender, juicy and melting. We have fruited it two years and consider it especially desirable for a standard white grape. Its season is from four to eight days earlier than the Concord.

Moyer. Vine resembles the Delaware in foliage, growth and hardiness, but its bunch and berry are much smaller; berry sweet and melting. We fruited it this season for the first time. It ripens about a week before the Delaware, and this quality will make it desirable, if it proves to be sufficiently vigorous and productive.

Woodruff Red. A new red grape. Vine vigorous, healthy and hardy; bunches small; berries large, bright red, with a beautiful bloom; flesh foxy, pulpy and sweet. We have fruited it but one season. I think it of too poor quality to pay for planting.

Wyoming Red. Vine vigorous, hardy and healthy, but only moderately productive with us; bunches small to medium in size, compact; berries medium size, bright red; flesh sweet, pulpy, quite foxy, but it is very good for such an early variety. It is said to be growing in favor in the East as a very early red grape, and is well worthy of trial by vineyardists here.

Varieties planted at the experiment station that have not yet fruited:

Eaton.	Dracut Amber.	Poughkeepsie Red.
Herman Jaeger.	Rommel.	Peter Wylie.
G. W. Campbell.	Brilliant.	Ebony.
Atavite.	Red Bird.	Monitor.
Solin Crup.	Theophile.	Marie Louise.
Illinois City.	Bertha.	Dr. Warder.
Emma.	Witt.	Nectar.
Rockford.	Mills.	Triumph.
Colerain.	Early Ohio.	Geneva.

EVERGREEN SEEDLINGS.

The work of raising coniferous evergreen seedlings, referred to a year ago, has been continued the past season. Further work shows the great superiority of a sun screen, that is high above the bed and allows for a good circulation of air underneath it, over a low screen. This was one of the worst of seasons for "damping off" in the seed bed, yet under screens six feet above the bed, such as I have recommended for shading strawberries, there has been almost no loss at all.

ROCKY MOUNTAIN EVERGREENS.

After a careful study of these very beautiful and useful evergreens, I have commenced raising the following kinds from seed obtained from high altitudes on the eastern slopes of the Rocky Mountains:

Heavy-wooded or Bull Pine (*Pinus ponderous*), Colorado Blue Spruce (*Pica pungens*), Engleman's Spruce (*Picea Engelmanii*), Abies concolor Douglas Spruce (*Pseudosaga taxifolia*) and Mountain Balsam (*Abies subalpina.*)

Experiments of minor importance which have been completed or are in progress are:

Variety tests with 21 kinds of tomatoes; variety tests with 50 kinds of potatoes; variety tests with 26 kinds of sweet corn; variety tests with 20 kinds of garden peas; experiments in grafting grapes; experiments to demonstrate the effect, if any, of electricity on plant growth when applied to the soil; experiments in shading of strawberry beds to increase the certainty and amount of the crop; experiments with raising sand cherries from seed with the object of producing improved fruit. (In conducting this work over 4000 sand cherry seedlings have been raised, and I consider the work of great promise.) Experiments with raspberry, strawberry, grape and gooseberry seedlings, the object being to produce kinds of these fruits that are better adapted to our conditions than any we now have. In conducting this work over 5,000 seedlings of these fruits have been raised.

I have been called upon during the past year to investigate the work of the downy mildew in vineyards around Lake Minnetonka, where the treatment of fungicides has given nearly entire immunity from the disease, and this at a cost sufficiently low to permit of its being used on a large scale. By request an investigation has also been made into the adaptability for cranberry raising of some large marshes in Otter Tail county.

DISCUSSION.

Mr. Sampson: I would like to ask if the Professor noticed whether the perfect blossoming varieties of the grapes were able to pollenize in good shape; for instance, the Moore's Early, if he noticed that it was a shy bearer.

President Underwood: I think Mr. Sampson's idea is with regard to the fertility of the blossom. I believe I called attention to the report of one of the eastern horticultural experiment stations—I think it was that at Geneva—in which there was a great deal of importance attached to the fact that most varieties of grapes have not perfect blossoms. It gives the names of those varieties, of those kinds that have been tested, and the Moore's Early is one of them.

Mr. Heideman: I have observed the grape blossoms this spring, and my experience is that the Moore's Early has as perfect a flower and you can get as good fruit from it as you can from the Concord or the Lady.

Mr. Wedge: It seems to me that it is very clear that the Moore's Early does not fruit as freely as it should. The bunches are perfect; they are good solid bunches—but the difficulty is to get it to form bunches at all. We can overcome that by longer pruning, by allowing it a good deal of wood.

President Underwood: If Prof. Green, as superintendent of our experiment station, had made careful investigations and experiments in regard to this matter of fertilization of grapes, and had found that they were imperfect in fertilization themselves, or that it was owing to that lack of fertilization that they had not produced fruit, and had reported it in detail as has been done by the eastern experiment station, we would have a great deal of confidence in that report and would think we ought to look into the matter. The report from the eastern station is very carefully and minutely given, and I think this is a question we ought to look into this coming year.

REPORT AT SUMMER MEETING.

PROF. S. B. GREEN.

ST. ANTHONY PARK, July 8, 1892.

Mr. President and fellow members of the Minnesota State Horticultural Society:

It is my earnest wish that the summer meeting of our society shall prove an enjoyable and profitable affair, and I have no doubt that it will, for I have myself been several times most agreeably entertained by our worthy president and his charming wife, who are to be your hosts. I know you will enjoy the time spent with them and in the nursery. I would like to be with you, but various circumstances seem to make it necessary for me to go East a few weeks at this time and so to be absent from the meeting. If I were to be with you I should, undoubtedly, talk some of the station's strawberry crop, which is just now at its best, and I think perhaps a few preliminary notes on it may not come amiss at this time.

We have two strawberry beds; from one we are taking the first crop and from the other, the second. Taken as a whole, the old bed is rather more productive than the new one, but please bear in mind that the old bed was well thinned, cleaned and manured after the crop was gathered last July and is now much like a new bed.

NOTES ON A FEW VARIETIES.

Among the varieties that are freely advertised and have, undoubtedly, come to your notice are the following:

Michel's Early. (b). I think well of this variety as a pollen producer, but it does not produce much fruit and has not been as productive this year as last. Yet the fruit this year was rather larger and better in quality. I mean to continue using it as a pollen producer. It is a vigorous grower and free from rust.

Haverland. (p). This variety has done much better this year than last and is in many ways our best berry and most productive. The foliage is healthy and the berries are elegant. I think it will produce rather more fruit this year than the Warfield.

Warfield. (p). This berry holds its own and is very productive. It is a better keeping and selling berry than Haverland. It is quite acid and our customers especially like it for canning purposes.

Parker Earle. (b). We have not had a ripe berry yet from this variety. It is at least ten days behind Warfield, and will ripen with us about July 13th. It is well loaded with green fruit and promises a good crop. It is very healthy and blossoms late. I think it a safe berry so far as late spring frosts are concerned, but coming so late and in such warm weather, I am afraid it will be very apt to fail to mature its full crop.

Bederwood. (b). This is a very promising new berry and has done remarkably well with us this season. It is bi-sexual, has lots of pollen, and I think it well worth trying. Its foliage is only slightly affected with rust.

Great Pacific. (b). I am somewhat disappointed in this variety. Some of the fruit is large but much of it is small and irregular in shape.

Saunders. This new much-praised seedling has done almost nothing in fruit production, though it produced a good lot of plants.

Pearl. (*b*) Is a beautiful, bright red berry that did poorly with us last year, but this season is very productive.

Van Deman. (*b*) Did very well with us last year, but this season it seems inclined to rust.

The much praised *Lady Rusk* was a failure in 1890 and 1891, and again this year.

Bubach. (*p*) Will give us a few magnificent berries, but not enough to make a profitable crop.

Jessie. (*b*) Is a failure with us. Perhaps, it had too indulgent a guardian when young, for I hear many reports against it.

Captain Jack. (*b*) Has rusted so badly that it will not mature a tenth part of the fruit set.

Crescent. (*p*) Is doing well, but is not nearly as productive as Warfield and a few others, though it is still worth holding on to.

Mrs. Cleveland. Has done very well.

Park Beauty. Will yield a fair crop of medium-sized berries, but its foliage is badly rusted.

Wilson. (*b*) Is not worth growing on our grounds.

Enhance. (*b*) Has produced some very good fruit from August set plants, but needs another season's trial to thoroughly test it.

Seedling No. 7. (*b*) From John Little; is one of the most striking in foliage and fruit of all that have come to my notice for several years. The foliage is tall and dark green. The fruit is large, fine and forms on long peduncles. Very productive and a promising late kind.

Seedling No. 9. (*p*) Also from John Little; is very productive, and a promising variety of large size.

Lovett's Early. (*b*) This is a berry of good color, form and substance, but not sufficiently productive to be profitable.

Osaola. Is the same as Michel's Early.

Olive. Is a berry sent us from F. Strubler, of Naperville, Ill. This is the second year we have had it on our grounds. It is a very strong grower, but is a total failure so far as fruit is concerned.

Tippecanoe. Is ruined by rust.

Boynton. (*p*) Is a red berry, about the size and with much the appearance of the Crescent, but no better.

Oregon Everbearing. Whatever everbearing qualities it may once have had, it does not show them here, and I rather doubt whether it ever boreover any number of consecutive seasons more than one crop a year. Not desirable.

Schuster's Gem. (*p*) This variety did remarkably well with us last year, but not so well this. It is of good size and promising.

Mammoth, Great American, Middlefield, Wolverton, Farnsworth, Gov. Hoard and Atlantic are none of them possessed of any striking merit this year.

FERGUS FALLS STATION.

F. H. FIEDLER, SUPERINTENDENT.

Mr. President and members of the State Horticultural Society:—In making my report as superintendent of the experiment station at Fergus Falls, I must first say that on account of damage done by cattle to the experimental plants, shrubs and vines in October, 1891, the crop the past season was to quite an extent diminished, and in some cases entirely destroyed.

All plants at the station that were planted in 1891 were perfectly hardy except the Thompson's Prolific and Golden Queen raspberries, and the Erie and Crystal White blackberries.

All the raspberries, blackberries and gooseberries were covered with earth, strawberries with old straw.

Received from the central experiment station, St. Anthony Park, Minn., on May 13, 1892, the following experimental stock, by American Express:

3 Lieby apples.	1 Hartford grape.	2 Cheney plums.
3 P. Greening apples.	Pkg of Kansas raspb'ry.	3 Pres. Hayes apples.
3 Early Strawb'ry apples.	12 Older blackberries.	4 pears (no name).
3 Sw't Russ. crab apples.	3 Martha apples.	2 Thaler F apples.
3 Sweet Russet apples.	1 Rockford plum.	2 Desota plums.
1 Lindley grape.	2 4M apples.	2 Gypsy Girl apples.
1 Lady grape.	3 Pride of Mpls apples.	2 Silken Leaf apples.
1 Brighton grape.	3 Virginia crab apples.	3 Cross apples.
3 Charlamoff apples.	3 Romna apples.	3 Hibernal apples.
3 Good Peasant apples.	Romensko apple.	

All the above named stock was in very good condition when received, and all grew very well except three pears, which died in July—I put a lot of unleached ashes around the fourth and it lived, but I cannot yet say whether on account of the ashes being mixed with the ground, or whether it would have lived anyhow. This tree grew very stocky and healthy leaves, something I have never seen before on a pear tree in this county. Will try ashes again to find out if it has any influence. Apple trees look very well but did not shed their leaves this fall—they are still on the trees. Wood seems hard and well ripened.

Received from central experiment station on June 3, 1892, by express:

10 Sandoval strawberries.	10 Schuster's Gem strawberries.
10 Great Pacific strawberries.	11 Michel's Early strawberries.
10 Bederwood strawberries.	10 Warfield strawberries.

Plants good and very stocky; grew well.

REPORT OF STRAWBERRIES FRUITED IN 1892.

Bubach No 2 (P.) The largest berry on the ground. Light colored, firm enough for home market. Plant very vigorous. One of the best berries for this part of the state, if not the best.

Cloud (P.) Did not fruit much. Fruit as large as the Crescent. Berry is firm but of very poor quality.

Daisy (P.) Not so productive as the Crescent nor as large.

Jessie (B.) A fine berry. The largest yielder here this year. Firm and of fair quality, fruit large.

Oliver (P.) Did not bear.

Warfield No. 2 (P.) This variety beats Crescent in productiveness. Not quite as sour as Crescent. Makes more runners than any other variety I ever observed. Color darker than Crescent.

Wilson (B.) Too small to be of value.

Crescent (P.) As good as many new varieties, but I think the Bubach and Warfield will knock it out.

Haverland (P.) Did not bear.

Red Jacket (P.) Does not bear enough fruit to be of value.

Manchester (P.) Yielded as much fruit as the Crescent, but the fruit is not as large. Very good flavor.

Have ¼ acre planted to Crescent, Wilson, Jessie, Warfield No. 2, Bubach No. 5, Red Jacket, Manchester, Daisy, Cloud, Haverland, Countess, Great Pacific, Shuster's Gem, Michel's Early, and Bederwood, all of which I hope to fruit next year.

CURRANTS FRUITED IN 1892.

Crandall. Did not bear; growth very stocky; foliage distinct.

Stewart. A good yielder; fine large berries; growth slow.

Fay. Berries larger than any other variety on the ground except the Lee's Prolific, but not productive enough for either home use or market.

Victoria. Not productive.

La Versailles. Only had one or two bunches of berries to a plant.

Cherry. Berries not quite as large as the Stewart, but yields as many bushels as that variety to a given piece of ground. A standard variety here, every farmer grows it.

Lee's Prolific. Large berries of a flavor peculiar to the wild black currant (ribes floridum.) Quite productive.

Houghton gooseberry. Berries large, ripening about August 10th to 15th; very productive and of good quality. Mildewed somewhat but not much.

RASPBERRIES FRUITED IN 1892.

Philadelphia. A shy bearer here. Does well at Perham.

Turner. Berries were too small this summer. Good bearer most years.

Caroline. Berries soft and of poor flavor, but very productive. Canes are lying down and berries will get dirty, unless well mulched. Very hardy.

Cuthbert. This grand berry stands at the head of all raspberries for productiveness, size and quality. As hardy as any, when covered in winter. Have grown it seven years.

Golden Cap. Not productive enough this year.

Gregg. The best blackcap I know of; large size; good flavor and very productive. Canes break easy when bent above the ground in laying down. Growth very stocky.

Gladstone. An everbearing variety. Berries commenced ripening July 25th, and continued to do so in succession until to-day, Oct. 26th. Berries small, of no value for market. Dull purple color with whitish bloom.

Golden Queen. Did not fruit with me this season. Canes broken off by cattle in 1891.

Wineberry. Did not fruit.

Thompson's Prolific. Did not fruit; damaged by cattle.

Progress. An early blackcap; berries too small and not very productive; good flavor; soft.

Kansas. Nearly the same as the Progress, bearing a week longer. Berries too small.

Cromwell. Did not bear.

Ada. Blackcap. Productive, but berries very small.

The following varieties will be fruited next season: Philadelphia, Turner, Caroline, Cuthbert, Gregg, Gladstone, Golden Queen, Wineberry, Thompson's Prolific, Progress, Kansas, Cromwell, Ada, and Older; all very stocky and healthy. All laid down and covered except 1½ rows of Caroline.

BLACKBERRIES FRUITED IN 1892.

Lucretia (dewberry.) Quite productive, but of very poor quality and flavor. The berries are mostly small, and three-fourths of them are imperfect as if the stigmas were not all pollenized; and while some ovules grow into seeds and the surrounding pericarp ripens, others remain in an immature state. If a variety of dewberries can be found or originated that does not have this defect, and which will be of better flavor, it will be a great success, ripening as it does just before the blackberries. Vines grew 4 to 10 feet this season.

Erie. About the same in flavor as the Lucretia dewberry. Ripens very late. Size about the same as the wild blackberry.

Ancient Briton. Did not bear much, damaged by cattle. Berries mostly large and of good quality.

All blackberries were covered with earth this fall. The Crystal White I think will prove too tender for this climate even when so covered. Was frozen to the ground this spring when uncovered, although it was in good condition when covered in 1891. In fact, it was the best looking plant on the ground the first year. Have no new blackberries that will fruit next year.

Russian Poplars. Received in 1891; all are doing very well.

Russian Willow. Received in 1891; grow slower than the former; the poplars made three to four feet of new wood and the willows two.

Russian Pears. Received in 1891; are all dead; all died during the summer of 1892; cause, unknown; stems shrivel up, leaves look as if they had been too near a fire, and finally the whole tree dries up.

GRAPES.

I have one-half acre of grapes at the station; part planted in 1891, and part in 1892, on sandy soil underlaid with stiff clay mixed with limestone; slopes, west, on east bank of a lake. None fruited except the Drakut Amber, which is rather too late a grape for this part of our planet. I am afraid I did not get a chance to test the fruit, as others were quicker. This variety is the stockiest grower on the grounds. Hope to fruit some other varieties next year. Names of varieties planted are: Lady, Brighton, Green Mountain, Telegraph, Woodruff Red, Drakut Amber, Moyer, Hartford, Lindley, Victor, Martha, Moore's Early, Worden, Barry, Concord and Delaware. All grapes are covered with earth for protection. I tried to raise peanuts this year, but they did not get ripe; will try again. Rec't. 57 black sand cherries from Perham this May, all seedlings of the best selected plants; would like to get some yellow sand cherry seedlings.

Buffalo berry. Looks well; grew one and one-half to two feet; rec't. 1891.

VARIETIES.	Date of vegetating.	Date of blooming.	Date of first ripe fruit.	Date of first picking.	Average diameter in inches.	Quality (scale 0 to 10.)	Firmness (sc. 0 to 10.)	Value for market, (scale 0 to 10.)	Value for home use, (scale 0 to 10.)	Vigor (scale 0 to 10.)	Hardiness (scale 0 to 10.)	Productiveness (scale 0 to 10.)	General appearance (scale 0 to 10.)
Strawberries.													
Crescent	Uncovered May 15—	June 5	June 22	.....	1 to 1¼	8	9	9	9	10	10	8	9
Wilson		June 5	June 20	.....	¾	5	10	5	5	6	10	4	7
Jessie		June 6	June 28	.....	1 to 1¼	7	7	9	7	9	10	10	10
Bubach, No. 5		June 5	June 25	.....	1½" 1¾	8	8	10	9	10	10	9	10
Warfield No. 2		June 6	June 24	.....	1 to 1¼	9	10	10	10	10	10	9	10
Manchester		June 7	June 27	.....	¾ to 1..	7	6	7	8	8	10	6	8
Red Jacket		June 7	June 25	.....	½ to 1..	6	7	6	8	7	10	5	8
Green Prolific		June 26	.....	.....	¾	....	....	0	0	8	6	0	9
Haverland		June 9	....	.....	.....	....	..	....	....	9	10	....	10
Cloud		June 9	June 27	.....	¾ to 1..	8	9	6	5	10	9	7	8
Daisy		June 14	June 25	.....	¾ to 1..	8	8	4	5	10	10	8	10
Early		June 13	July 10	.....	¾	6	9	2	3	8	10	2	8
Oliver		June 7	.....	.....	.....	....	..	....	....	10	10	....	10
Raspberries.													
Philadelphia	Uncovered May 17—	June 17	July 18	July 24	½	4	5	7	9	8	...	5	10
Turner		June 15	July 13	July 20	½	6	8	8	7	....	....	7	9
Caroline		June 17	July 14	July 20	¾	5	3	5	10	10	....	10	10
Cuthbert		June 16	July 29	Aug. 5	1 to 1¼	10	8	10	10	7	9	10	8
Golden Cap		June 20	July 18	July 24	¾	7	8	4	10	10	10	4	5
Gregg		June 17	July 24	July 30	1	10	10	10	10	9	6	8	10
Gladstone		June 23	July 26	July 30	½	6	5	5	9	6	9	6	6
Golden Queen		June 27	.....	.....	.....	....	....	....	....	5	10	....	7
Wineberry		... .	.....	.....	.....	....	....	....	....	7	10	....	9
Thompson's Prol.		June 18	.....	.....	.....	....	....	....	....	8	9	....	6
Progress		June 17	July 15	July 24	¾	8	10	7	9	10	7	4	10
Kansas		June 19	July 19	July 24	½	7	7	4	6	10	9	5	10
Cromwell		.....	.....	.....	.....	....	....	....	....	8	10	....	7
Ada		June 18	July 17	July 24	.....	10	9	7	6	9	2	4	9
Blackberries.													
Crystal White	Uncov'd May 19	.....	.....	.....	.....	....	....	....	....	....	8	....	9
Lucretia d'w b'ry		June 19	Aug. 7	Aug. 11	½ to ¾	4	9	0	0	10	9	6	8
Erie		Aug. 5	Sept. 18	Sept. 20	½	3	5	5	6	6	8	3	7
Ancient Briton		June 20	Aug. 14	Aug. 20	¾ to 1. (Scale 1 to 10.)	9	8	9	10	6	9	7	7
Currants.													
Crandall	May 14	June 14	.....	.....	.....	....	....	....	....	10	10	....	10
Stewart	May 16	May 24	July 7	July 15	9	10	10	10	10	10	10	8	10
.....	May 16	May 25	July 9	July 15	10	10	10	5	4	8	10	1	7
toria	May 18	May 24	July 10	July 15	7	4	10	2	2	8	10	3	10
a Versailles	May 14	May 23	July 8	July 15	8	9	10	2	2	10	10	1	10
erry	May 15	May 25	July 14	July 15	7	9	10	9	10	9	10	10	10
e's Prolific	May 10	June 3	July 14	July 20	10	7	9	0	5	9	10	6	10
Gooseberries.													
Houghton	May 7	May 21	Aug. 10	Aug. 16	10	9	6	10	10	8	9	10	10

WINDOM EXPERIMENT STATION.

DEWAIN COOK, SUPERINTENDENT.

I have but little to report at this time. The past season has not been a good one for experimental work. We had a very cold and rainy spring, to which the failure of many varieties of fruits may be attributed. We also had much rain during the months of June and July.

STRAWBERRIES.

Of strawberries we had about two-thirds of a crop. Warfield No. 2 gave the best satisfaction; it did not set as much fruit as some other varieties but every berry was a perfect one. The Haverland gave too much imperfect fruit. Michel's Early is no earlier than some other varieties; it is a

very light cropper; plants are healthy and great growers. The Enchance is a most promising variety; it is an immense grower with foliage entirely free from the prevailing leaf fungus. The Sandoval failed from leaf blight and I have marked it n. g.

DWARF JUNEBERRY.

The dwarf Juneberry, as usual, has done finely; it is perfectly hardy and has not been troubled by insect or leaf fungus; it is productive and the fruit sells well in our local market. I do not hesitate to recommend it.

CURRANTS.

Red currants set but little fruit and that mostly dropped before it matured; the new growth was unsatisfactory; one thrifty bush of the Crandall bore only two specimens—one large and the other quite small. I do not consider the black currants as hardy as the reds.

GOOSEBERRIES.

Gooseberries produced fairly well, although we had some mildew on most varieties; the Downing was free from mildew and gave the best satisfaction.

RED RASPBERRIES.

Many varieties of the red raspberry failed with me the past season. I cannot name the cause in each instance but it was in most cases due to leaf fungus or blight in some form. The two varieties that bore the heaviest in 1891, failed entirely the past season. They were the Reliance and Cuthbert. The Brandywine gave the best satisfaction of the reds, but even they give indications of failing.

I have some red caps that I have been growing for about a dozen years past that do not appear to be affected by the prevailing disease. I presume they are unnamed seedlings. I notice that a raspberry plantation is less hardy after it bears a heavy crop; we have to get at least two full crops off a variety before we can decide that it is desirable.

As a fall-bearing variety the Gladstone is quite a novelty, but I believe that the fall crop comes too late in the season to be of any practical value for us.

BLACKCAPS.

Black raspberries as a class bore very well and were little affected by the leaf blight. So far as tested the Souhegan and Gregg, early and late, are the best of their class, and the only ones needed either for home use or for market. I am in hopes that the Sprye's Early may prove an acquisition as an extra early variety. I fruited the past season some 24 varieties of the raspberry. The blacks must be given winter protection.

GRAPES.

Of grapes I fruited 17 varieties, and in spite of the unusually wet season we had a fine crop; the Delawares especially were extra fine, as also were the Moore's Early and some other varieties. The Wordens were disappointing; they set for a big crop, but did not ripen evenly; there seemed to be two sets of fruit on the same stem. I consider the Moore's Early the best black grape.

BLACKBERRIES.

Blackberries have done finely; the Stone's Hardy is the hardiest on my list, but the Snyder and Ancient Briton are of better quality; Agawam and Waschutt rank with the Snyder for hardiness and are not so difficult to lay down for winter, but they lack the quality. All varieties must have winter protection in order to bear well.

DEWBERRIES.

Dewberries also produced well, the Windom being mostly grown. We are also growing the Bartell and the Lucretia, and think very highly of them. They have never failed to bear abundantly of fine fruit where the canes had not been winter-killed.

CHERRIES.

We have several varieties of Russian cherries that are doing fairly well, having fruited some of them for three years. The birds and children usually take the fruit about as fast as it gets ripe. The Early Richmond is reasonably hardy and a good cropper, but like the other varieties gave little fruit the past season. My most promising cherries are some Russian seedlings. I am trying the sand cherry; have not fruited it yet; it is easily propagated by cuttings. We fruited nine (9) varieties of cherries besides our seedlings.

PLUMS.

Plums were practically a failure, although about all varieties produced some fruit. The plum gouger did an unusual amount of damage. Of the known kinds the Forest Garden is considered the most reliable and valuable. The Desota set considerable fruit, but it was of inferior size and was badly stung.

I would call attention to the Wolf plum. It is not a freestone, as it is sometimes called. I am not sure but it is the most valuable plum in my collection. It should be more generally planted.

Mr. A. Norby of Madison, South Dakota, sent me specimens of a plum that he calls the Iowa; it is a good plum, and on account of its extreme earliness it may prove valuable. I would recommend it for trial at our experiment stations.

RUSSIAN PLUMS.

We fruited six varieties of the Russian plums. Like the natives, they produced very sparingly. The fruit is larger than our natives, and most of the varieties appear hardy. I am convinced that we can grow these plums all right, but they are inferior in quality to our best natives. It is probable that the Early Red is the best of its class. These plums are all blue or black, even to the Early Red Russian right from the Iowa Agricultural College grounds. I don't understand it. The Russian No. 3 and Arab are also promising varieties. It seems to me that the crossing of these plums with our best natives should be undertaken by our experiment stations.

PEARS.

My only varieties are Russians. They were mostly set the spring of 1886 and seem perfectly hardy, but as yet none of them have fruited. I have five varieties that promise to fruit next season; 392 is the only variety that showed any blight the past season. My most promising varieties are: Tonkeveithka, Lemon, Gaskovka, Bessamanka and 518. I have hopes that we can grow these pears here.

APPLES AND CRABS.

Of these I have something over one hundred varieties; my orchard is young and but few varieties have borne any fruit.

There was less blight at this station than usual, although there was more than usual in this part of the country; we had leaf disease or leaf scab on many varieties during July and August. The Russian varieties were comparatively free from leaf fungus or curl. The varieties that blighted the most were: Transcendent, Hyslop, Lake Winter, Green Streaked, Whitney's No. 20 and Gipsy Girl. I have about fifteen hundred trees in my apple orchard and the most of them are looking fine. I attribute my success to liberal fertilizing and root protection. One of my neighbors practices girdling to induce fruitfulness with good success; this may be a useful field to experiment in. Several parties in this county were induced to box their trees according to Mr. Brand's plan, but each case heard from was attended with disastrous results. I would say go slow on boxing your apple trees. I expect to fruit some seventy-five varieties of apples and crabs this coming season, in which case I hope to be able to make a more complete report on this class of fruit.

RUSSIAN POPLARS.

I have been testing some fifteen or twenty varieties of the Russian poplars and willows, and in most cases I have been disappointed in them, especially in the poplars; they seemed to lack hardiness or adaptability. The populus Siberea may be of some value; I would recommend it for trial.

RUSSIAN WILLOWS.

As to willows—the willow worms have been so bad here for a few years past that we have about given up the willow; but there are two varieties of these Russian willows that I would call attention of this society to, they are the laurel-leaf willow (salix laurifolia) and salix acentifolia; they are both free growers, are not injured by the willow worm and are ornamental. The Russian golden willow (salix aurea) I consider valuable; it is ornamental in winter and is an upright and rapid grower.

RUSSIAN OLIVE.

I am highly pleased with the Russian olive (Elægnus angustifolia) or as the Mennonites here call it, the oil-berry; it is hardy and thorny, a rapid grower, ornamental, and I am of the opinion that it will be valuable for hedging.

CONIFERS.

The spruce, pine and cedar do very well here; juniper savin is promising. I received last spring from Wisconsin some 12,000 forest-pulled evergreens; they gave good satisfaction.

ALBERT LEA EXPERIMENT STATION.

CLARENCE WEDGE, SUPT.

APPLES—For four or five years prior to the past season this station has enjoyed a perfect exemption from fire blight. During that period there has not been a twig touched upon even the varieties known to be most subject to its attack. About the middle of last June, however, the disease made its appearance both at the station and in neighboring orchards in severity about as great as I have ever observed in this section of the state.

The Duchess planted for comparison, as it should be at all stations, in various ages and positions, sustained its reputation for resisting blight. Its seedlings, Patten's Greening and Peerless, planted two or three years ago, were also very perfect. A nursery row of two year-old Peerless did not show a blighted twig, while Whitney in an adjoining row showed blight in about every tenth tree. White Transparent, Long Arcade, and Kurskaga pear blighted almost beyond recovery. Ostrekoff 4 m, Cza's Thorn, and Charlamoff blighted quite severely, Other varieties blighted to a less degree as indicated in the table annexed, which also shows numbers and ages of trees.

The leaf fungus or scab, so ruinous among the American varieties in Iowa, reached to this station. All varieties of Siberian crab were affected. The Briar Sweet losing most of its foliage. The Maiden Blush, Early Strawberry and Minnesota were affected. The Martha crab was perfect in leaf and fruit, which indicates its reputed parentage, the Duchess apple. All varieties of Russian, with the Duchess and its seedlings, were also perfect.

Several Russian varieties, which showed fruit for the first time, proved to have been received at this station under false names. Veronish Reinette proved to be an Anis. Fruit of Barloff and Vargul, submitted to Prof. Budd, proved to be respectively No. 579 and 321. Cross, 15 m, proved to be some other unidentified variety.

All varieties now reported as fruiting I believe to be true to name.

REPORT ON APPLES, 1892,

VARIETY.	When planted.	No. planted.	Who from.	No. dead.	Year died.	Blight, 1892.	Sunscald, 1892.	Present condition.	First fruited.
Duchess	1874	1		..	.....	Very little.	No.	Perfect.	....
Wealthy	1880	15	Home nursery...	5	'85-86.	Considerable ..	No.	Fair	....
Briar Sweet	1883	2	E. Wilcox	..	.....	No.	No.	Good	1890
Whitney	1883	2	E. Wilcox	..	.....	Very little.	No.	Good	1890
Charlamoff	1885	1	C. Luedloff	..	.....	Quite seriously	No.	Fair	1890
Anis.	1885	3	Prof. Budd	..	.....	Little.	No.	Good	1890
Antonovka	1885	3	Prof. Budd	2	1888.	Little.	No.	Good	1892
Recumbent	1889	5	C. G. Patten	..	.....	Little.	No.	Good	1892
Czar's Thorn	1885	2	Prof. Budd	..	.....	Seriously	No.	Injured.	1890
Ostrekoff 4 M	1886	1	Prof. Budd	..	.....	Seriously	No.	Fair	1892
Martha	1889	2	C. G. Patten	..	.....	No	No.	Perfect.	....
Tetofsky	1880	2	Home nursery...	..	.....	Very little	No.	Good	1889
Elgin Beauty	1881	1	Cook, Rochester.	..	.....	Very little.	No.	Good	1890
Maiden Blush	1883	2	E. Wilcox	..	.....	Little.	No	Fair	1890
White Transparent.	1887	5	A. G. Tuttle	3	1888.	Very seriously.	No.	Bad	1890
Longfield	1887	10	A. G. Tuttle	6	1888.	Considerable. .	No.	Good	1890
Hibernal	1887	3	A. G. Tuttle	..	.....	Little.	No.	Good	1890
Patten's Greening	1890	5	C. G. Patten	..	.....	Very little	No.	Fine	1892
Long Arcade	1887	1	A. G. Tuttle	..	.....	Very seriously.	No.	Bad	1892
Blue Anis	1887	2	A. G. Tuttle	..	.....	Little	No.	Fair	1892
No. 321...	1887	2	A. G. Tuttle	..	.....	Very little	No.	Good	1892
No. 579	1887	5	A. G. Tuttle	..	.....	Little	No.	Good	1892
Repka Malenka	1887	10	A. G Tuttle	2	1888.	Considerable	No.	Fair	1892
Richland Winter	1890	2	A. G. Patten	..	.....	Little..	No.	Good	....
Striped Anis	1890	1	C. G. Patten	..	.....	Little	No.	Good	....
Good Peasant	1890	2	C. G. Patten	..	.....	Very little	No.	Fine	.. ..
Wealthy	1890	3	C. G. Patten	..	.....	No	No.	Fine	....
Roman Stem	1890	1	C. G. Patten	..	.....	No	No.	Fine	....
Peerless	1891	5	O. F. Brand	..	.....	No	No.	Fine	....

Dates of ripening of *crops* of Apples as noted at this station the present season:—Tetofsky, Aug. 15th; No. 579, Aug. 26th; No. 321, Aug. 27; White Transparent, Aug. 29; Czar's Thorn, Aug. 31; Charlamoff, Sept. 3rd; Duchess, Sept. 3rd; Anis, Sept. 14th; Whitney, Sept, 16; Briar Sweet, Sept. 17.

Varieties set in 1891:—Arabian, Newell's Winter, Haas, Romenshoe, Antonovka, Arthur, Wolf River, Howard's Best, Peter, Muscatel Rainet, Talman Sweet, Melinda, Juicy Burr, Red Transparent, Romna.

Varieties set in 1892:—202, 4 Orel, 56 Vor, 22 M, 190, 4 M, Boydanoff, 3 M, Striped Winter, 277, 28 M, Red Sport, Skalanka Bog, 169, 152, 245, 20 M, 424, Persian Bog, Bog White, 12 M, Cross Vor, 1277, Charlamoff, 185, Iowa Beauty, Duchess, Wealthy, 30 M, 980, 379, 252, 469, 167, Prolific Sweeting, Duchess No. 6, Virginia Crab.

PLUMS.—On account of overbearing the preceding season, the Desota failed to set a crop for the first time in five years. Forest Garden bore a few quarts. The Cheney, Rockford, and Wolf, set in 1891, made surprising growths.

The following varieties were set in spring of 1892:—Richland; Mazerka, Beer Plum, Vor Yellow, Moldavka, 20 Orel, Early Red, Hawkeye, White Nicholas, 19 Orel, Orel Green, 21 Orel, Blue Communia, Wolf, Blackhawk, Rolling Stone.

CHERRIES.—The Minnesota Osthiem, set in 1885, although yet healthy and thrifty, has failed to set a pint of fruit, and the few specimens that

ALBERT LEA TRIAL STATION.

Bearing.	Size of fruit.	Quality.	Season	Remarks.
Heavy.	Large.	Acid, good.	Sept.	Var. gen'y p'f'ct in this sect'n
Heavy.	Large.	Best.	Jan.	Bore v'ry heavily this season
Good.	Of Hyslop.	Sweet, good.	Sept.	Lost all fruit and much fo-
Good.	Larg'r than Hyslop	Pleasant dessert.	Sept.	[liage from scab.
Good.	Size of Duchess.	Dessert.	Sept.	Rip'nd exactly with Duchess
Shy.	Small to medium.	Good.	Nov.	One of the Anis family.
				Only a specimen of fruit.
	Large.	Excellent culinary	Dec.	Can discover no diff'nce bet.
Good.	Medium to large.	Sweet, good.	Sept. 1.	Very slow grower. [Hibernal.
	Medium	Fair.		Will recover, if it blights no
				[more.
Moderate	Medium	Pleasant dessert.	Aug.	
Good.	Small to medium.	Poor to fair.	Jan.	
Fair	Of Transcendent.	Delicious.	Dec.	Leaf and fruit scabbed.
Fair.	Medium	Acid, good.	Aug.	
Very h'vy	Small to medium.	Dessert, good.	Dec.	A profitable variety.
Heavy.	Large to very l'rge	Excellent culinary	Dec.	Very vigorous and healthy.
	Large to very l'rge	Choice culinary.	Dec.	Also a good dessert fruit.
	Small.	Fair.	Sept.	
Shy.	Medium	Good.	Nov.	
	Large.	Sweet, choice.	Sept.	A very attractive tree.
Moderate.	Medium	Sub-acid, good.	Sept.	
Good.	Small.	Fair.		Seems to be a late keeper.
				Very upright grower.
				Probably Longfield.
				Put in for comparison.
				Top worked on Virginia.
				Very vigor's, large, thick leaf.

have reached maturity have been of small size and low quality. The following varieties were set in orchard in 1892: Double Natte, 6 Rui, 23 Orel, Late Morello, Wagner, Lutovka, Koper, George Glass, Strauss Wiechel, Koper, Grirotte du Nord, 24 Orel, King's Amarelle, Brussaler Braun, Fraundofer Wiechel, 109 Riga, Skalanka, Junat Amarelle, Girotte de Osthiem, Bessarabian, Bender, 27 Orel.

TREES AND SHRUBS.—The following were set in 1892: Prunus Maacki, Strawberry Tree, Dwarf Juneberry (Dartt), Bearberry, Persian Lilac, White Tartarian H., Viburnum Opulus, Alnus Incana, Lonicera Cutea, Ribes Alpinum, Caragana Redowsky, Spiraea Hypericofolia, Josikea Lilac, Lonicera Media, Lonicera Grandiflora, Russian Snowball, Acer Ginnala, Caragana Pygmae, Spiraea Douglassi, Rosa Rugosa, 88 Riga, Philadelphus Grandiflora, Philadelphus Speciosa, 144 Vor, Berberis Amurensis. More than 95 per cent of the trees and shrubs, both fruit and ornamental, set in the past two seasons, have lived and made satisfactory growth.

EXPERIMENT STATION, MINNESOTA CITY.

O. M. LORD.

The specialties named for this station are cherries and native plums. A part of the grounds are occupied with other fruits, such as apples, strawberries, raspberries, black and red, blackberries and grapes, the growth, habits and adaptability of which are carefully observed from year to year, though not considered wholly experimental. A list of the varieties grown here may be desirable for reference for those who would plant under similar climatic conditions. The apples consist o Wealthy, Walbridge, Fameuse, Shockley, Golden Russet, Peach, a few Russians and a few Wealthy seedlings, and several varieties of crab apples.

The plums number 50 varieties, covering nearly all that have attracted special notice under cultivation. The bearing trees of cherries are the German Ostheim. There are 27 varieties of Russian cherries that have made a fine growth but have not yet fruited. The strawberries are, Crescent, Capt. Jack, Manchester, Bubach, Warfield, Princess, Downers, and Jessie. Red raspberries. Turner, Cuthbert. Black raspberries, Gregg, Tyler, Nemaha and Palmer, also a fine growth of the Shaeffer. Of blackberries the Ancient Briton, Snyder, Taylor and Early Harvest. Of grapes the Concord, Delaware, Agawam, Moore's Early, Worden, Iona, Massasoit and Lindley. Several varieties of all the fruits named above except of blackberries, have either died out or have been discarded as worthless or as not adapted to soil, climate or conditions. For the purposes of the society a record of the failures is as necessary as that of success. Wealthy and Duchess apples were plenty. There was no fruit of plums nor of cherries in this vicinity the past year. The excessive wet and cold weather at blossoming time prevented the formation of fruit. Strawberries, blackberries and grapes bore abundantly.

The habits and blossoms of the cherry and plum were more particularly observed last spring than those of other fruits. The cherry trees blossomed profusely and set considerable fruit, which turned yellow and dropped to the ground when about the size of field peas.

I had a good opportunity to observe the bees gathering pollen from cherry blossoms. When the pollen was in the right condition, which occured in some cases before the stigmas were receptive, the bees were very active in gathering it. While it was easily seen that the pollen was stripped from the anthers by the mouth, it was very difficult to see the method of transferring it to the legs for carrying. They did not gather it continuously but cropped and re-cropped the stigmas several times, gathering from side to side instead of continuing around the circle, and they invariably took all the pollen the blossom contained. Their movements were remarkably quick, usually occupying less time upon one blossom than it would take to read one line of this paragraph. In their work upon the plum and apple blossoms they did not take all the pollen as from the cherries, the reason of which, I suppose, was because it was not all ripe enough for their purpose. Whatever the climatic conditions necessary to pollenizing may be, the bees certainly perform an important part.

Nearly all native plums produce an abundance of pollen, but some varieties are more or less deficient in stigmas every year, and some years are entirely deficient. This habit is, I believe, peculiar to some varieties, not only when indigenous or growing wild, but when transferred to other localities the habit is intensified, so as to produce imperfect stigmas or, perhaps, none at all. While this habit will account for the non-bearing of some kinds, whether isolated or in groups, and whether well cultivated or otherwise, it does not afford a reason why they are without stigmas nor suggest a method by which they may be produced.

From the fact that the trees do not all blossom at the same time or mature their pollen at the same time, it is well known that by planting different kinds near together they are more apt to be fruitful; hence, it has been supposed that this would be sufficient in all cases to secure fruitfulness. I have a group of trees that blossom profusely every year that has never produced any fruit; growing within a few rods, another group that has borne nearly every year for 40 years. The blossoms of the first named group bear no stigmas, many of the blossoms having not even the rudiments of one. But I was greatly surprised this year to find no stigmas in the blossoms of some kinds that have borne fruit for several years in succession till this year, from which I conclude that there is a wide field in this direction for experiment and investigation.

NEW ULM STATION.

C. W. H. HEIDEMAN, SUPT.

Samuel B. Green, Esq., Supt. Central Experiment Station.

DEAR SIR: I hand you herewith my third annual report as superintendent of station for experiment with plums and native fruits.

PLUMS.—Generally speaking, the plum crop was a complete failure; the only fruit obtained was by hand fertilizing and protecting the blossoms. In this manner we secured first fruits of the following: Early Red Moldovka, Hungarian, White Nicholas, *Russian* Bohemian Nos. 5 and 6. Only a few specimens were secured and they were small. Abundance *Japan* is very distinct in foliage, a very strong grower but not quite

hardy. The past two winters the tips were badly frozen. Abundance makes a very late terminal growth. Sheuse apricot winter kills even more so than the above. The past two winters have been unusually mild and it is fair to presume that the Abundance plum and Sheuse apricot are beyond their latitude anywhere in Minnesota.

SEEDLING SAND CHERRIES.—From a promiscuous lot of sand cherry pits received from South Dakota and northern Minnesota, planted in 1890, at least twenty distinct variations (better than the type) in fruit, size, color and quality were produced. As no attempt was made towards selection in this first lot of pits planted, it demonstrates the great variability of the sand cherry under culture, and as we have in some of our seedlings many desirable qualities, it gives us hopes that in a few years varieties will be produced which will in many respects equal our best cultivated varieties of cherries. Budded on native plum our plants were loaded with fruit, while those on their own roots fruited sparingly.

BUDDED ROSES.—It may not be generally known, but our native wild rose, Rosa blanda, is one of the best stocks obtainable in the Northwest as a stock upon which to bud any or all of the Hybrid Remontant, Hybrid Tea, Hybrid Noisette, Tea, Bourbon and Noisette classes.

For the past five or six years we have been experimenting with roses on their own roots, budded low on Manetti, and worked as tree roses on native stock. The difference in favor of the native stock was observed by hundreds of visitors who saw our roses last summer. We have plants so worked, that are six years old, and they are just as healthy as can be. The union in nearly all cases is smooth and perfect. Dwarf and weak growing varieties are stronger and healthier than on own roots. From a row containing Hermosa, Madame Pierre Oger, La France, Madame Andre Duron, Queen of Queens, Reme Marie Henrietta, Bouquet D'Or, Celine Forestier, Madame Celeste, Etoille De Lyon, L'Abundance and Madame Georges Bruant we were able to cut roses every day from June 12th to Nov. 1st without a single exception, with here and there a magnificent bloom of Hybrid Remontants during the entire season.

As a rule all roses of less than a very vigorous growth do better, blossom more freely and stand the winter better when worked our native stock than when budded on Manetti or on own roots.

Such varieties as Hermosa (bourbon), La France (hybrid tea), Reine Marie Henriette (climbing tea), are wonderfully improved in size, color and freedom of bloom. We find no trouble from suckers after the first year, and know of no reason why roses so worked should not be long lived.

CROSSING AND HYBRIDIZING.

There are about fifty very promising seedlings of vites riparia fertilized by Lindley and Moore's Early, and as many more rose seedlings. Rosa blanda fertilized by various remontants and bourbons, demonstrate that as far as constitutional vigor and beauty of foliage is concerned the union is a beneficial one. At least two hundred apparently successful crosses and hybrid crosses were made and well developed seeds procured of the following record:

Ribes Floridum	crossed with	Danish black currant.
Prunus pumula	"	Miner plum.
Ostheim cherry	"	Prunus pumula.
New Ulm plum	"	Hungarian plum.

New Ulm plum	crossed with	Bohemian No. 6.
Rosa blanda	"	Various remontants.
Rosa blanda	"	Various bourbons.
Rosa blanda	"	La France.
Mad. George's Bruant	"	Mad. Gabriel Luizet.
Gen'l Jacqueminot	"	Alfred Colomb.
Ulrich Brunner	"	Alfred Colomb.
Moore's Early	"	Vitis riparia.
Iris versicolor	"	Iris Germanica.

SEEDLING GRAPES. Several years ago we planted quite a number of seeds of selected grapes, in each case selecting the largest and plumpest seeds. Two of them bloomed last year and proved staminate. Three seedlings fruited this year, but, alas, we had evidently carried our selection in the wrong direction. Our grapes showed wonderful improvement in size of—seeds. Two or three generations more of such selection ought to develop grapes with edible seeds.

EXCELSIOR STATION.

H. M. LYMAN, SUPT.

My report from this section will be brief. The apple trees I received last spring from the central station have done finely; those received one year ago last spring have not done as well. The Antinovka, Dartt's Hybrid, and No. 164 are dead from blight, also a variety labeled Kretshor, consisting of three trees, have all blighted to the ground. The blight about here has been worse than for several years past, though on part of my orchard even the Hyslop and Transcendent showed no signs of it. Last spring I planted a number of trees, seedlings and Duchess and Wealthy; I had discarded the latter from my list, but it is such a valuable apple, I think it will pay to continue planting even if does kill every ten or a dozen years; I also set out about three hundred root grafts from hardy seedlings.

I know but little regarding the quality of the Peerless, but I know it is as near blight proof as any other variety we have.

I have several seedlings which bore for the first time this year. The fruit was of medium size and fair quality and from hardy stock; but time alone will tell whether they will stand our climate. Apples about here for the past season were a medium crop, but the fruit was smaller sized than usual.

LA CRESCENT STATION.

J. S. HARRIS, SUPT.

Samuel B. Green, Professor of Horticulture of Minnesota State Farm School and Experiment Station.

SIR:—I am directed by the secretary of the Minnesota State Horticultural Society to report the progress of the experimental work being done on the sub-station located at La Crescent, Minn.

THE ORCHARD.

The orchard devoted to the testing of varieties now contains about two hundred trees of apple in about 75 varieties, besides some numbered seedlings. About one-half of the varieties are of the newer Russians. We

added to the number this season, two trees of Malinda, two of Patten's Greening, two of Iowa Beauty, two of Longfield, donated to us by C. G. Patten of Iowa. Not any fire blight has shown on the trees this season except upon Antonovka, Ostrekoff, 4 M, Gipsy Girl and Varzulek, and on those not to a damaging extent, although in our older orchard considerable blight appeared on a number of varieties. A few seedlings of American parentage were quite badly affected with mildew and leaf scab, which struck them about the first week in June, and we supposed was caused by unfavorable weather conditions, viz: excessive wet and warm cloudy weather. None of the trees have fruited this season except the Lieby, or Hibernal, and the Ostrekoff, 4 M, although a considerable number of the varieties carried some bloom. Not any of the new Russian varieties, or seedlings that can be traced direct to them, showed any of the scab, mildew or leaf blight above alluded to, either in the experimental or our older bearing orchard, although in the latter the Transcendent and nearly all other crabs, and the Haas, Walbridge, Fameuse and most of the other older American varieties were quite severely injured, so that the fruit produced was small, poor and of but little account; and many of the trees were so badly affected that they dropped much of their foliage in June, and made but little growth until towards fall. We have six trees of the Peerless; they all look very promising, have large healthy foliage and have made a vigorous growth.

In addition to the apples we have a small orchard of native plums on their own roots, chiefly Desota, Rolling Stone, Cheney, 6 Pifer's Peach, of bearing age, and the Ocheeda, Knudson Peach and several others not yet fruited. The plums bloomed very heavily last spring but the crop of fruit was a total failure, as it was generally throughout the Northwest. The foliage upon most of the trees appears to be affected much in the same way as the apples, and the trees failed to make their usual vigorous growth, and later in the season were much infested with aphis. We attribute the failure of the fruit crop to the prevalence of cold cloudy weather during the blooming season, and the almost entire absence of insects that at that time work on the bloom and affect pollenization, and the continued prevalence of weather that was favorable for the propagation of mildew and other fungus.

Of Russian pears we have planted six received from the central Iowa experiment station, six from the Minnesota station and one seedling. They have all made a vigorous wood growth, and none of them have shown any fire blight, but the foliage was somewhat spotted. We received from Prof. Green last spring two trees of Russian cherry, six of dwarf Juneberry and one of quince, the latter failing to grow, others looking well; also a few plants of raspberries and strawberries. Of older varieties, the Japanese wineberry is too tender for this climate and the fruit has no value for commercial purposes. We do not esteem the Michel's Early strawberry very highly for a market fruit, but it seems to answer a good purpose as a pollenizer. Parker Earle did not meet our expectation; one trouble appeared to be setting more fruit than could be brought to perfection. We shall give it further trial. The Gladstone raspberry continued to produce fruit most of the season, and late in October the plants were fairly well laden, but the fruit is under size, of a dull unpopular color and very poor quality, and not worthy of cultivation.

SUPLEMENTARY.—In connection with the station we have a small nursery for the propagation for trial of all such desirable varieties as can be secured and all the seedlings of promise, usually from 10 to 25 root grafts of each variety. Priority rights of originators and introducers will in all cases be respected, and scions are solicited from all parties who have valuable new seedlings. We added to the list last spring Boydonoff, Golden Bernette, Sklonka, Zuzoff's Winter and a dozen or more new seedlings. They were root-grafted last spring, have made a good growth and the surplus varieties not under restriction will be exchanged or sold at about cost of propagation.

MONTEVIDEO EXPERIMENT STATION.

LYCURGUS R. MOYER.

The Montevideo experiment station was established for the trial of ornamental trees and shrubs. It is located near the 45th parallel, 35 miles from the western boundary of the state. The trial grounds are located on a dry bluff, sloping to the west and northwest. The soil is a yellow loam, originally prairie. The situation is very bleak and exposed. It is believed that trees and shrubs that will succeed here can be grown throughout the prairie portion of the state.

The following list of trees and shrubs, native to this locality, are growing on the station grounds or in its immediate vicinity:

Bur oak, (Quercus macrocarpa); Green ash, (Fraxinus viridis); White elm, (Ulmus Americana); Red elm, (Ulmus fulva); Cork or rock elm, (Ulmus racemosa); White or silver maple, (Acer dasycarpum); Box elder, (Negungo aceroides); Hackberry, (Celtis occidentalis); Basswood, (Tilia Americana); Cottonwood, (Populus monilifera); Balsam poplar, (Populus balsamifera); American aspen, (Populus tremuloides); Ironwood, (Ostrya Virginica); Wild plum, (Prunus Americana); Wild red cherry, (Prunus Pennsylvanica); Choke cherry, (Prunus Virginiana and perhaps P. demissa); Sweet viburnum, (Viburnum Lentago); Red-berried elder, (Sambucus racemosa); Common elder, (Sambucus Canadensis); Minnesota honeysuckle, (Lonicera Sullivantii); Wolfberry, (Symphoricarpos occidentalis); Wild rose, (Rosa Arkansana); Juneberry, (Amelanchier Canadensis var. oblongifolia and Amelanchier alnifolia); Wild thorn, (Cratægus tomentosa); Meadow sweet, (Spiraea salicifolia); Missouri gooseberry, (Ribes gracile); Wild black currant, (Ribes floridum); Red osier dogwood, (Cornus stolonifera or C. sericea); Downy arrow-wood, (Viburnum dentatum); Prairie willow, (Salix humilis); Heart-leaf willow, (Salix cordata); Red cedar, (Juniperus Virginiana); Smooth sumach, (Rhus glabra); Wild grape, (Vitis riparia); Virginia creeper, (Ampelopsis quinquefolia); Burning bush or Wahoo, (Euomymus atropurpureus); Climbing bittersweet, (Celastrus scandens); Prickly ash, (Xanthoxylum Americanum); Moonseed, (Menispermum Canadense); Virgin's bower, (Clematis Virginiana); Green briar, (Smilax rotundifolia.

These trees and shrubs are all native to the extreme western part of Minnesota, and it is, perhaps, needless to say that they all succeed in cultivation. It ought not to need the report of an experiment station to show that these trees will succeed, for they are growing there already; and yet if a stranger should travel over our prairies and see the endless

repetition of cottonwood and box elder groves he might come away with the impression that these were the only trees that could be raised there.

There is also planted on the station grounds the following trees and shrubs not native to this locality:

Red willow (Salix fragilis); Pointed-leaf willow (Salix acutifolia); Golden osier (Salix vitellina); Napolean's willow (Salix Napoleonensis); Laurel-leaf willow (Salix laurifolia); Rosemary-leaf willow (Salix rosmarinefolia); Golden willow (Salix aurea); Goat willow (Salix caprea); Wisconsin weeping willow; Asiatic poplar (Populus certinensis); Dudley's poplar (Populus Dudleyi); Poplar, 28 Riga; Laurel-leaf poplar (Populus laurifolia); Bolle's poplar (Populus boleana); Pyramid poplar (Populus Siberica pyramidalis); Birch-leaf poplar (Populus betulifolia); White ash (Fraxinus Americana); Black walnut (Juglans nigra); Butternut (Juglans cinerea); Red oak (Quercus rubra); White oak (Quercus alba).

White spruce (Picea alba); Norway spruce (Picea excelsa); Colorado blue spruce (Picea pungens); Balsam fir (Abies balsamea); Arbor vitae (Thuya occidentalis); Arbor vitæ, Hovey's golden; Scotch pine (Pinus Sylvestris); Austrian pine (Pinus Austriacea); Dwarf monntain pine (Pinus pumilio and Pinus mughus); Cut-leaf birch; European white birch; European mountain ash; American mountain ash; Bird cherry (Prunus padus).

Plum, 19 orel (Prof. Budd); Plum, 20 orel (Prof. Budd); Plums, Nyant, Cheney; Apricot, Suda, Shensi, Alexander; Cherries, Bessarabian, Ostheim; Sand cherry (Prunus pumila); Prunus Maacki.

Common lilac, (Syringa vulgaris); White lilac (Syringa vulgaris alba); Charles X lilac (Syringa vulgaris var.); Persian lilac (Syringa Persica); Japanese tree lilac (Syringa Japonica); Lady Josika's lilac (Syringa Josikaea); Honeysuckle, (lonicera elegans) (Prof. Budd); Honeysuckle, (lonicera media) (Prof. Budd); Honeysuckle, (lonicera Tartarica); Honeysuckle, (lonicera Tartarica alba); Honeysuckle, (lonicera Belgica); Honeysuckle, (lonicera splendens) (Prof. Budd); Honeysuckle, (lonicera gracilis) (Prof. Budd); Honeysuckle, (lonicera Alberti); Kentucky coffee tree (Gymnocladus Canadensis); Mock orange (Philadelphus cordifolius); Mock orange (Philadelphus cordatus); Mock orange (Philadelphus grandiflorus); Mock orange (Philadelphus gracelis) (Prof. Budd); Mock orange (Philadelphus coronarius); Mock orange (Philadelphus speciosa) (Prof. Budd); Mock orange (Philadelphus 144 vor.) (Prof. Budd); Spiraea Douglasii; Spiraea hypericifolia; Spiraea Thunbergii; Spiraea Billiardii; Spiraea collosa; Spiraea nobleana: Spiraea prunifolia (Bridal wreath); Nine-bark (Physocarpus opulifolius); Pea tree Caragana arborescens); Pea tree (Caragana mollis) (Prof. Budd); Pea tree (Caragana mollis glabra) (Prof. Budd); Pea tree (Caragana frutescens) (Prof. Budd); Pea tree (Caragana Redowski) (Prof. Budd); Pea tree (Caragana pygmae) (Prof. Budd); Pea tree (Caragana, dwarf) (Prof. Budd); Ribes 48 vor. (Prof. Budd); Ribes degusha (Prof. Budd); Ribes aureum (Yellow flowering currant); Red-twigged dogwood (Cornus sanguinea); Cornelian cherry (cornus mascula); Wild olive (Elaeagnus angustifolia); Laburnum; Juneberry, Lovett's success; Juneberry, dwarf Mr. Dartt); Buffaloberry (Shepherdia argentea); Burning bush (Eunonymus Europeus); Barberry (Berberis vulgaris) Purple barberry, (Barberis vulgaris var. purpurea); Amur barberry (Berberis amurensis); Cut-leaf weeping birch; European white birch; Shrubby cinque-foil (Potentilla fruticosa); Clematis Jackmanii; Clematis viticella; Clematis violacea:

snowball (Viburnum opulis sterilis); Russian Snowball (Viburnum opulis sterilis) (Prof. Budd); High bush cranberry (Viburnum opulus); Rosa rugosa; Golden elder (Sambucus nigra var. aurea); Cut-leaf elder (Sambucus nigra var. lacinata); Russian mulberry (Morus alba var. Moretti); Buckthorn (Rhamnus catharticus); Polish privet (Ligustrum..... .....) Prof. Green and Mr. Dartt; Snowberry (Symphoricarpos.....) Prof. Budd; Alpine bearberry (Arctostaphylos alpina) (Mr. Dartt.)

It is proper to say that, as the station was but recently established, most of the trees and shrubs planted are very young, and more time will be needed to test their hardiness. Enough, however, is already proved to show that there are many trees and shrubs that may be safely planted on the prairies in all parts of the state up to at least the 45th parallel.

Most of the Russian willows and poplars are doing well. Populus Certinensis is particularly promising. Goat Willow is hardy. Wisconsin Weeping Willow freezes back some. Salix Vitellina wintered without injury last winter, although when younger it killed back to the ground each year. Its bright orange-red limbs in winter make it very desirable to brighten up winter shrubbery. Salix 14 Vor. seems to be the same as Salix Vitellina. Populus 23 Riga seems to agree with Prof. Green's description of Populus Wabski, and it, perhaps, is the same. Populus Bolleana is a fine tree quite distinct from the ordinary Silver-leaf Poplar. Young trees of the Laurel-leaved willow were injured some last winter, but they will doubtless do better as they get older. Salix Napoleonensis freezes back every winter and does not seem to increase in hardiness with age.

Colorado Blue Spruce, White Spruce and Balsam Fir are all doing well. I have been unable to make White Pine grow here, and I doubt that any one has succeeded with Norway Sprute here. Those who have planted Black Spruce brought in by teams from the swamps to the northeast of us have all been disappointed. European Larch after growing for six or eight years appears to fail. Dwarf Mountain Pine is extremely hardy and one of our most promising evergreens. Our native Juniper is extremely hardy too. All the lilacs that I have tried succeed and make themselves at home. The new Japanese Tree Lilac seems to be as hardy as the others. All of the bush honeysuckles do well. Our native Lonicera Sullivantii is one of the best. Lonicera Gracilis and Lonicera Splendens from Prof. Budd are doing finely. The Philadelphi are all good. 144 Vor. of Prof. Budd is doing exceedingly well. The spiraeas need more moisture than we are apt to get in western Minnesota. Spiraea Hypericifolia and Spiraea Nobleana from Prof. Budd seem to be doing the best. The caraganas are all doing well. The common Yellow Flowering Currant is an excellent shrub. Cornus Sanguinea from the nurseries seems to be the same as our native cornel. Both do well. Lovett's Success Juneberry promises well. Prof. Budd's Russian Snowball seems to be an improvement on our common one. Golden Elder and Cut-leaf Elder freeze back some but are doing pretty well. I become year by year more convinced of the desirability of our native Viburnum (Virbunum Lentago) for ornamental planting. It is, as it grows here, one of the finest shrubs we have, but I do not find it in any of the nurserymen's lists.

OWATONNA STATION.

E. H. S. DARTT, OWATONNA.

SANTA BARBARA, CAL., Jan. 15th, 1893.

Mr. President and members of the Minnesota State Horticultural Society:—Gentlemen, I hail you this time from wonderland—a land made doubly attractive to me by contrast. In passing through Montana, Washington, Oregon and California I have noticed that a very large proportion of the land is unsuited to cultivation. And as scarcity creates demand, the good land is very high-priced, sometimes running up to $300, $500 and even $1,000 per acre for choice locations with water rights in southern California. High-priced land means high-priced production, and herein we understand why it costs much more to live in California than in Minnesota.

These beauty spots of creation are often reached by traversing some of the most God-forsaken regions on earth. Let us imagine the utter desolation of some of the mountains and the stifling heat and dust of the desert in summer—then enter one of these beautiful valleys and speed down amid ever increasing attractions until we meet the cooling and refreshing sea breeze, and finally enter some haven of rest, like Santa Barbara. We may liken the trip to a passage through purgatory to reach heaven. Here our joys should be complete, and probably will be, if our stock of gold is abundant and we dispense it freely, for the rich are way up, with a disposition to stay, whilst the poor are way down, with seemingly no power to rise.

Riverside is the prettiest town I ever saw. The orange tree, bending down under its load of golden fruit and evergreen foliage, is the prettiest tree I ever saw, and Riverside is among the orange groves. Its streets are lined for miles and miles with artistically trained cypress hedges, and its street trees of magnolia, fan palm, pepper tree and others of rare beauty, interspersed with century plants and flowering shrubs, make up a picture that fills us with pleasurable amazement beyond description.

Bewitching California! She has gold, but no coal; she dazzles our eyes with her show of wealth and refinement, and she fascinates us with her delightful climate, her luscious fruits, and ever-blooming flowers; yet, through this glitter and glare we think we see that in those elements which go to make up happy, intelligent, prosperous and populous communities, the solid foundation of great states, she is not in advance of some of her less pretentious neighbors.

The most equable and delightful climate is found on the sea coast in southern California, interior sections suffering more from oppressive heat and dust, and sometimes from destructive frosts.

Persons of substantial wealth should visit California as they would attend a show. To such persons the show is worth the admission fee, and they may safely tarry to their hearts' content. But the poor should understand that people seldom make money by attending shows, and, further, that it is impossible to enter into the full appreciation and perfect enjoyment of the beauties of creation on an empty stomach.

The work on the Owatonna tree station for the past year has been but a repetition of other years, consisting of the planting of choice seeds and the gathering in of promising varieties grown by others, and grafting all promising new seedling apples, and testing as many as possible in orchard.

Preparations have been made for making 2,000 root grafts of about seventy-five varieties, among which are a goodly number of seedlings from the best Russian varieties, also seedlings of the Wealthy and other American apples. Mr. Gideon's noted Minnesota seedlings are all on trial, and when King Cold comes around again as he did in 1884 and 1885 and knocks out all the varieties that he did then and others of like ilk, we may reasonably hope that by noting the survival of the fittest a few varieties may be found of real permanent value. The orchard now contains 600 trees, and 120 more will be added in the spring. All trees have done fairly well, none being injured by cold and few by blight.

As I intimated in my last report, the work of the stations has outgrown the appropriation for expenses. Those of your members who are or have been nurserymen, and have kept fifty varieties from getting mixed, as our Russian varieties are now mixed, may realize how much care and attention is necessary to keep six or seven hundred varieties so that any one can be readily found. And again, if they will survey the whole field and note the fact that there are no recorded precedents or books showing how best to do these things, and consider the further necessity of finding some method by which three or four hundred dollars' worth of work can be done for $200, they will extend sympathy at last.

As it is likely that nine-tenths or more of all the varieties of apples and crab apples we have on trial will fail in some of the essential points, we will economize by not reporting failures, except as regards well known varieties. Persons desiring information in regard to those not reported should ask for it.

Surplus stock can be disposed of much more cheaply by way of the brush pile than by packing and shipping, which requires preparation, makes much trouble, and will not pay when done on a very small scale. The ultimate benefits are likely to be just as great by the former method, for by the latter method many things would be sent out not having been fully tried.

GENERAL FRUITS.

REPORT ON GENERAL FRUITS, FIRST CONGRESSIONAL DISTRICT.

M. W. COOK, ROCHESTER.

Mr. President, ladies and gentlemen:

It is said that one-half of the world does not know how the other half lives, but for various reasons the most would like to know. Some, that they might have a broader field for carrying out their low, sensual, devilish purposes; others, with a feeling of selfish jealousy and pride, hoping to learn that no others were more prosperous or blest than they, and with the continual uprising in their hearts of the spirit which the make-believe religious man had, who always offered the blessing at the table, asking the same thing: "Oh Lord, bless me and my wife, my son John and his wife, us four and no more. Amen." Others with true missionary spirit even leave home and friends, take their lives in their hands, cross the mighty ocean and penetrate the dark places of the earth, if necessary, to carry life and joy to those who are in need.

It is this spirit of good-will and desire to benefit others that has lead you to ask for reports from different parts of the country as to the amount of fruit grown, knowing that no country home is what it should be without a bountiful supply, grown by themselves.

It is no longer a question whether large and small fruits can be successfully grown in this state to well supply home markets or even for shipment. In fact, the time has already come when some of us who are growing small fruits as a specialty, with our thirty to fifty acres already in full bearing, question whether, possibly, we are not overdoing the market.

The results of the past few years' experiments ought to encourage the heretofore faithless owners of land to set both large and small fruits, sufficient to supply themselves with an abundance. There is no reason why this should not be done. There seems to be a growing interest in the matter. The fact that our local markets are well supplied with home grown fruits in their seasons gives encouragement to others to plant.

It is estimated that over five thousand bushels of apples were grown in and about Rochester this season. Three thousand five hundred bushels by R. C. Keel, the next largest amount by the Hon. Wm. Somerville, whose specialty is Russian varieties, the balance by different ones, mainly farmers.

The small fruit crop amounting to over seventy thousand boxes, was not all we hoped for in yield, but considering prices obtained was very satisfactory. Owing to the incessant rains in the spring, strawberries bore a light crop, the blossoms being injured by hot sun and showers, and the fruit failing to mature.

From my own thirty acres of strawberries, raspberries and blackberries I marketed forty thousand boxes; average price obtained, eleven cents per box. I began picking strawberries for market June 27th, and continued picking and marketing strawberries, raspberries or blackberries up to Sept. 24th, with a few cases each day to Oct. 6.

The strawberries I grow for general crop are Crescent, Warfield, Bubach, Haverland, Jessie, Capt. Jack, Crawford and Bederwood, with a few acres of newer varieties that I have faith in, some of which are very promising, such as Lovett's Early, Gillespie, Enhance, Parker Earle, Wolverton, Saunders, Great Pacific, Princess and Pearl.

Red raspberries—Turner, Cuthbert and Marlborough.

Black raspberries—Souhegan, Tyler, Ohio and Nemaha.

Blackberries—Snyder, Ancient Briton and Stone's Hardy.

I lay down everything and cover with dirt and mulch, hauling in mulch between the rows in winter. After the bushes are lifted in the spring, I put mulch on under the bushes deep enough to keep weeds down and guard against drought, cultivating but a narrow strip between the rows. Results, big berries and lots of them.

I will not at this time trouble you with a detailed account of the modes of training and culture, as good instructions to the inexperienced can be found in your reports.

I had hoped and expected to make my report to you in person, but now fear I shall not be able to meet you at this time. Nevertheless, remember that I would be extremely pleased and gratified to see every individual member at my home in Rochester. You will always find the latchstring out, and if you come at the right season I can give you fruit to eat or plenty of weeds to pull.

Hoping that you will all have a pleasant, profitable and enjoyable meeting, I am, as ever, your well-wisher.

REPORT ON GENERAL FRUITS, SECOND CONGRESSIONAL DISTRICT.

S. D. RICHARDSON, WINNEBAGO CITY.

To the members of the State Horticultural Society:

The open winter injured some raspberries that were not covered, but not all, and the cold wet weather of the spring seemed to have a bad effect on the leaves and fruit of the crab apple. Plums, both tame and wild, were almost a total failure. With the exceptions noted, fruits of all kinds bore a heavy crop. The Snyder blackberry came through all right even when uncovered, and the crop was unusually large; also strawberries and currants bore a fair crop, but not so large and nice as in 1891. Gooseberries were good. Grapes were very late, but the warm, late dry fall caused them to ripen fairly well. For the first time in the history of the county Wealthy apples were shipped from Winnebago City by the car load, and many Duchess went to waste because the supply was greater than the demand. The Minnesota is doing well and bears heavily when the tree attains sufficient age.

The Malinda is attracting considerable attention on account of its good keeping qualities. The tree seems to be healthy, but does not look any better than Haas of the same age.

I saw one tree of the Roman Stem fifteen or twenty years old, that hung very full and was apparently healthy and sound.

REPORT ON GENERAL FRUITS, SECOND CONGRESSIONAL DISTRICT.

ALFRED TERRY, SLAYTON.

Mr. President and members of the Minnesota State Horticultural Society:

Being myself but an amateur in fruit raising, I was surprised to find myself appointed on the committee on general fruits; the fault is yours, not mine. Feeble as it is, I obey, and make the following report:

Late frosts and immense rains almost destroyed the strawberries in my section of the state, and we must decidedly put it down as an off year for this desirable small fruit.

Raspberries did very well and may be called an average crop. Souhegan and Ohio, I think, did the best among the black-caps. . These we have to cover, using slough hay, if we can get it, on account of its being free from weed-seeds and its adaptability to hold down the canes. We realized twenty cents per quart and were unable to supply the demand.

Currants were a lighter crop. They blossomed well, but a late frost destroyed half the bloom. I sold all I had to spare at fourteen cents per quart, and there was a demand for more.

Russian mulberries were almost a failure.

Grapes did well; not being uncovered till after our last frost and being planted on high land, they escaped the misfortunes of the other fruits. Worden, Concord and Moore's Early were, I think, the best.

Apples were not a full crop, yet it was a paying one, Duchess of Oldenburg and Wealthy being the best standards and Whitney No. 20 the best hybrid.

I had two Russian apricot trees which blossomed well, but the bearing branches afterwards died, from what cause I do not know.

I wrote to many fruit growers in my part of the country for reports, but the replies were so few and feeble that I have had to make this report from my own observation.

REPORT ON GENERAL FRUITS, THIRD CONGRESSIONAL DISTRICT.

G. W. FULLER, LITCHFIELD.

The past year has been an excellent one for fruit of all varieties; and yet, owing to the previous years of drouth and the consequent weakness of the plants in the fall and the superabundant cold rains of the spring, the strawberries—my own at least—were nearly a failure. We had a hail-storm when apples were about half-grown, and currants were ripe, which injured these crops in some places. Yet, there were some very fine apples, Hibernals, Ostrekoffs and some Wealthys, exhibited at our

county fair. It was a bad season for blight, especially on the Transendents. Raspberries, both red and black, yielded medium crops. Currants and gooseberry bushes hung full. A few blackberries were raised, but they are an expensive luxury for me to grow. There are a few places where some fine grapes were grown.

I think for a year or two the people have been a little more encouraged about growing fruit, at least they are disposed to try again.

REPORT ON GENERAL FRUITS, THIRD CONGRESSIONAL DISTRICT.

SETH H. KENNEY, MORRISTOWN.

On account of press of business it will be impossible for me to be present at the annual meeting. I here mention some of the fruits that have done well the past season in Rice county. First on the list is the Duchess of Oldenberg, as far as my observation goes. The trees were all loaded and the fruit generally brought good prices. I had several trees about twelve years old that averaged $1 per tree. All over the county this apple was the most promising of all on the list. Whitney's No. 20 also paid well and generally bore a good crop. Tetofsky bore better than usual. Wealthy—from two trees that survived the winter of 1885 and 1886, I picked one barrel. The last-named trees have had their trunks boxed several years, and have in a large measure recovered their vigor from the above-named winter. Meaders Red Winter bore heavily and are valuable for their keeping qualities. The Transcendents that in the past have paid so well were a complete failure, as far as my observation extends. A blight or mildew attacked the leaf and fruit. Some Snyder blackberries received from Mr. Cutler of Sumter bore a fine crop. The Windom dewberry has been with me a *complete failure each year*. Strawberries were a short crop. Grapes generally yielded well.

The orchard of 300 Wealthy and 100 Duchess has been set, with the present winter, three winters. The trunks were boxed and filled to the top, two and one-half feet high and eight inches square, with earth; many of the trunks are over one inch in diameter and eight feet high. I am well satisfied with this experiment, and many of the farmers of Rice county have adopted this plan, after looking over this orchard. It is a safe insurance against seven winters. Each fall I mulch about the boxes with coarse manure. I found the trees that were heavily mulched did not leave out as early as some that were not much mulched. I shall look for some fruit next season. Some have thought the earth left in the boxes would injure the trees, but the results are convincing proof. My past experience in fruit growing in Minnesota has not been a success, but present prospects look better.

REPORT ON GENERAL FRUITS. FOURTH CONGRESSIONAL DISTRICT.

J. F. ZATTERSTROM, SPENCER BROOK.

I regret very much that I shall not be able to attend your next annual meeting, and I doubt if I shall have anything of interest to report to such an intelligent body, that will warrant the encroaching upon its equally valuable time.

We had at our county fair this year some fruit on exhibition of the following varieties of apples and crabs: Duchess of Oldenburg, Minnesota, Transcendent, Hyslop and some smaller crabs. The Duchess of Oldenburg in this section, where the soil is sandy, have without fail died after bearing a good crop; Transcendents and other crabs have blighted and partly died after a heavy crop, started from the roots again and commenced anew. Of the grapes, Janesville, Champion and Moore's Early ripened their fruit and bore a good crop, Janesville taking the lead in growth of fruit and vine on my farm. Farmers who wish to secure other small fruits, such as currants and gooseberries, should observe the following rules without fail: Plant no more than you can keep clean from weeds the whole season, and give as much manure as you would an ordinary garden crop, and you will be surprised at the result when your shrubs get to be four years old.

My wish and hope is that the society may be able to make itself more known to the majority of farmers. A more liberal support from the state would assist in this: first, by having its reports more liberally distributed; second, by a closer connection with the experiment farm. Be it remembered that neither the work of the experiment farm or the horticultural society is known to only one or two in a hundred of the farmers. If our county fairs could be so regulated that part of their fees paid in by members could go into your treasury, the state in return therefor to guarantee a report (bound) from the experimental station and from your society, we could, I believe, awaken more interest in agricultural and horticultural education. I also believe that the county agricultural societies should be the medium through which seedlings and new fruits should be distributed. Our county fairs, I fear, have served their time of usefulness if we cannot introduce some new educational features in their programs, first, by giving them the benefit of the knowledge already obtained, and, second, by requiring part of the state donations to be expended for essays and practical reports on practical results arrived at.

REPORT ON GENERAL FRUITS, FIFTH CONGRESSIONAL DISTRICT.

B. C. YANCEY, EDINA MILLS.

Apples were not very good in this section of the country. They blossomed very full in the spring but were struck with a blight, and the result was that the apples were small and knotty. The Duchess was the best.

The raspberries were a light crop. They were considerably winter-killed. The Cuthbert generally brought the best results. Strawberries were very good this year.

The currants yielded very abundantly and were exceptionally fine in quality.

The blackberry crop was very heavy and the berries very large and fine. The Ancient Briton yielded the heaviest.

The grapes were injured considerably by mildew. The Janesville and Moore's Early ripened well. The Concord ripened only fairly and the Delaware did not ripen at all.

REPORT ON GENERAL FRUITS, SEVENTH CONGRESSIONAL DISTRICT.

D. T. WHEATON, MORRIS.

Mr. President and fellow members:

My observations in the line of general fruits have been much less and thorough than I desired to have them. What I have to report will be chiefly concerning Stevens and adjoining counties. You are well aware that this section of the state grows but little fruit. The all important question is, can fruits be successfully grown in this section with ordinary care? If the experience of a majority of those who have tried to raise apples should be taken, the answer would be in the negative, but the majority are not always in the right.

There are probably fewer apple trees growing in this county to-day than ten years ago. This unpleasant fact is, doubtless, owing in a large degree to the planting of tender varieties, the fruits of which look well in the agent's plate-book and which promised to be hardy. Doubtless, many died from lack of proper care and some from blight and other good causes; but experience proved the sad fact that most of the trees went to the brush pile and that only a few of the hardiest and best cared for survive. The survival of the few show that apple trees will grow and that apples can be raised here. The past season was favorable for the growth of trees. There was little or no tree blight. The apple crop was good, and although the number of trees was limited, the crop in the aggregate was considerable. The varieties grown were chiefly Duchess, Wealthy, Whitney's No. 20, Transcendent, Hyslop, Beecher's Sweet, Power's Red and other varieties. A few seedlings promise well and bore some this season. Some Russian trees are making a healthy growth and blossomed for the first time.

The raising of plums seems to give the best promise of success of all the larger fruits. All of the leading varieties of native plums are grown without any trouble. Some seedlings and some growing wild in the groves are not much, if any, inferior to the better known varieties. The plum crop was nearly a failure, but few trees or groves having any fruit. The trees blossomed full and the fruit set, but soon turned into puff-balls. What the cause was I should like to have you tell. There are a few Lombard plums grafted on native stock, that are thrifty and seem to be hardy and have been in bearing for several years.

There are some tame cherry trees that are thrifty and appear hardy and are commencing to bear.

Russian mulberries are growing, but the fruit is of little account. Should think it would make a good hedge. Grapes grow with protection, and the fruit ripens before hard frosts. The Concord, Delaware, Janesville and Worden are the chief varieties and all do well. Currants flourish well with good care and do well even with neglect. There was an abundant crop. The Houghton, Downing and Smith's Improved gooseberries all grow with no protection and yield an immense crop. The Turner raspberry proves itself to be a good bearer and very hardy, with or without protection. Blackberries grow and yield a good crop with winter protection. Strawberries were an abundant crop, with half a chance. Yet, with all the success that is had with growing small fruits, there are com-

paratively few gardens where any fruit, whatever, is grown. There are few gardens where fruits are grown for the market. Most of the fruit consumed is grown abroad.

A good garden among the farmers is the exception and not the rule, as it should be.

With the success attending the few who are raising small fruits in abundance for their own use and to spare and who are raising apples in a limited scale, the question is often asked: "Why cannot I grow them?" I believe that there is an increasing interest in general fruits, and that each year will show a decided advance.

REPORT ON GENERAL FRUITS, SEVENTH CONGRESSIONAL DISTRICT.

REV O. A TH. SOLEM, HALSTAD.

I would be glad to give an encouraging report from this part of our state, but I am sorry to say I cannot. When I came here ten years ago I was told we could raise no fruits here, our summer was too short and the climate too cold. Some of our old settlers had bought trees for $20.00 and $30.00, but had none left, etc.

I found lots of small fruits in our woods, and a few years ago I made up my mind I would start on a small scale. The first mistake I made was to order from a traveling agent. Now I order direct, and always have success with exception of strawberries. We generally have a dry spell at the time the strawberries are ripening, hence the result is not encouraging. Last fall was very dry, and my strawberries had a hard time. I went through them with my hand cultivator about twice a week.

My experience is that we can raise several kinds of raspberries and, probably, more blackberries, if we cover in winter.

My mistake is that I have been trying to raise fruit without winter protection.

My raspberries gave a fair crop last year.

Victoria currant, as usual a heavy crop.

Cherry currant, poor crop. (The Cherry currant is shy bearer with me.)

Prince Albert currant, a very good crop.

Red and White Dutch, a good crop.

White Grape, a light crop.

Downing's gooseberry, a good crop.

Siberian crab, a very good crop.

Whitney's No. 20, a fair crop.

Mr. Pearce of Chowen sent me 12 Tonkas last spring. They all made a fine growth and stand O. K.

REPORT OF VICE-PRESIDENT OF FIRST CONGRESSIONAL DISTRICT.

CLARENCE WEDGE, ALBERT LEA.

Your vice-president, having reported to the secretary both as superintendent of experiment station and as a member of the committee on apples, finds little to add by way of report as vice-president.

The general condition of fruit raising in our part of the first congressional district has so far been far below the needs of the market. The only surplus that has ever been shipped from our section has been of that much maligned fruit, the Minnesota apple. The crop of small fruits, even in our best seasons, has not been sufficient for the home demand. The burning drouths have discouraged many growers, and it may be true that there is now a smaller acreage devoted to berries than there was five years ago. The Crescent, Wilson and Glendale, in about the order named, furnish the bulk of the strawberry crop. Prices received by the grower the past season were about 10 cts., which, considering the excellent crop, must have yielded a fair profit. Raspberries were very profitable, the crop and prices being of the best. Scarcely any blackberries are raised and no cherries. Plums were a complete failure on account of wet weather at blossoming time and general overbearing the previous season. Is it not strange that no one steps in to supply the demand for a high grade native plum? There is no fruit raised at my place that is so eagerly called for as my small surplus of Desota plums. Grapes were not a full crop. It proved to be one of the few seasons that ripen the Concord to perfection; we received five and six cents for them and eight cents for Delawares, the latter being most in demand. If we can ever persuade the Moore's Early to yield heavily, it will be the variety for the market, as it can be marketed before the New York fruit comes on, and its fine large berries please the eye and disappoint not the palate of the buyer.

The feature of our fruit crop this year was a phenomenal crop of apples, and the glory of it lay in the fact that several carloads of our beautiful Duchess were shipped to the south, where for once they had the privilege of eating apples free from worm or scab. Price paid for Duchess at Albert Lea was 50 cents per bushel. The Wealthy for the first time appeared on our market in quantity; it was well appreciated and brought from $1.00 to $1.50 per bushel. All varieties of Siberian blood were so badly affected in foliage and fruit by scab that they were nearly a failure.

A great loss to raisers and consumers results from the careless handling of summer apples. Our merchants were quite enterprising in attempting a reform in this particular. Bushel baskets were sent out to the orchards to be filled there, and one or two car loads were shipped in baskets, thus avoiding any handling of the fruit from the orchard to the consumer. But even by this method there was such rough handling and dropping of fruit, and fast driving without springs, as resulted in very serious loss in value. As usual, also, a large share were brought to market in that most abominable of all packages, the common grain sack. This ignorant and careless handling diminished the value of our apple crop by at least 25 per cent.

At the Freeborn county fair there was one of the finest lot of apples ever brought together in the West. The total bulk of fruit shown, amounting to nearly thirty bushels, included fifty-four varieties. The entries numbered 121, and were made by thirty-nine exhibitors. It was made in a separate pavilion and attracted as much or more attention than any other feature of the very successful fair.

As was stated at the beginning of this report, our fruit raisers are not measuring up to the needs of the market or their own opportunities; but it is hoped that the past favorable season, the fine exhibits at the fairs and the influence of horticultural meetings will give an impetus in the direction of more and better home-grown fruits.

List of varieties of apples shown at the Freeborn county fair, 1892:

Wealthy.
Duchess.
Utters.
Haas.
Talman Sweet.
Walbridge.
Malinda.
Plumb Cider.
Whitney.
Charlamoff.
Anis.
Antonovka.
Lieby.
Czar's Thorn.
Ostrekoff 4 M.
McMahon.
Elgin Beauty.
Cross.
Patten's Greening.
Longfield.
Hibernal.
Long Arcad.
Blue Anis.
Summer Lowland.
Repka Malenka and 15 seedling and unknown varieties.
Varieties of crabs:
Maiden Blush.
Minnesota.
Hyslop.
Sweet Crab.
Malikoff.
Palmer Sweet.
Orange.
Early Red.
Briar's Sweet.
Martha.
Beacher's Sweet.
Virginia.
Sylvan Sweet.
Soulard.

REPORT OF VICE-PRESIDENT, THIRD CONGRESSIONAL DISTRICT.

L. E. DAY. FARMINGTON.

Mr. President, secretary and members of the Minnesota Horticultural Society: —The past season has been a peculiar one. First, the spring was cold and wet; on this account grapes, currants and strawberries were injured; and later the advent of the apple scab and the great numbers of insects on apple and other foliage. Yet, in this district we have been quite successful in the raising of different varieties of fruit.

Of standard apples there was a good crop, principally Duchess, although Wealthy, Haas and other varieties, where alive, were loaded with fruit. Apples did not keep as well as usual. Hybrids and crabs bore heavily, yet they seemed to be affected by the scab more than the standards. The worst affected on my grounds were the Power's Red, Transcendent and Minnesota. Maiden's Blush, Meader's Winter, Montreal Wax, Beacher's Sweet, Orange, Briar's Sweet, Quaker Beauty and Greenwood all gave good crops.

Plums. Although the trees were full of bloom in the spring, fruit was a failure.

Grapes, currants, raspberries and blackberries bore a large crop of nice fruit. I never raised as nice blackberries before. They were the Snyder, Stone's Hardy and Taylor's Prolific.

The blight has been very bad the past season; few trees escaped its ravages. Even Briar's Sweet and Maiden Blush were touched by it, and also other trees that heretofore were quite free from it have been affected.

I think that the interest in fruit raising in this part of the state is increasing. Many are planting the newer varieties of apples, also Russian and some of the older sort.

VICE-PRESIDENT'S REPORT, SECOND CONGRESSIONAL DISTRICT.

DEWAIN COOK, WINDOM.

The past has been a season of successes and of failures. The strawberry was not up the expectations, through a good many were grown, mostly in the eastern part of the district. The Crescents are mostly grown. The Cumberland has given the best of satisfaction wherever tried. The prices have ranged from eight to fifteen cents per quart. The strawberry is one of our reliable fruits and is destined to be more largely grown.

The raspberry crop was light and of poor quality, in many cases the crop was an entire failure, the cause appearing to be a plant disease, that is sometimes called "the curl." Where the plants were badly affected the fruit had a bitter taste. I believe the Turner and Brandywine to be the two best varieties; they are hardy and not as liable to overbear as some other varieties.

The blackcaps were but little affected by the prevailing disease, and the same may be said of the redcaps. They are but little grown here, not as much as they should be; they bore well and the fruit was of good quality. The Gregg and Souhegan are good varieties to grow. The outlook for the raspberry is not particularly bright. We will have to grow less of the sucker varieties and more of the caps. What we most need is a hardy vigorous redcap that is of good size and color and firm enough to ship.

The currant crop was very poor; perhaps, they were only taking a rest after producing the heavy crop of the previous year. It seems to be a misfortune for the currant, the raspberry and varieties of other small fruit to bear an extraordinarily heavy crop; I have doubts about their ever fully recovering from it. The Downing gooseberry has done finely; other varieties had more or less mildew.

Although the season was extraordinarily wet up to about the first of August, we had a very good crop of grapes. Of black grapes, the Moore's Early I consider the most valuable. The Delaware is a reliable and valuable grape and will bring the most money in our market.

As grapes are shipped in in great quantities from southern Iowa and western New York, and sold so cheap, I do not consider the growing of them for market a paying industry; but every farmer and lot owner can and should have an abundance of home-grown grapes. There are not many blackberries grown in this district, but what we had that were given winter protection did finely. If we could only have moisture enough at the right time, the growing of the blackberry could be made a paying industry.

The dwarf Juneberry is at home here and should be grown in every garden.

The plum crop was light and inferior in most respects to the preceding year. The people have not yet learned the value of the best varieties of natives. I expect the time will come, and in the near future, when the native plum will be considered a valuable fruit to grow. I would recommend the Wolf and the Forest Garden as being among the most profitable varieties to grow.

As to apples, as our county is new, that is, most of it, we are not yet shipping apples to Iowa and Missouri by the car load, but we had a good crop and they are coming into some of our markets by the wagon load, and there is a feeling among our citizens that we can grow the apple.

There seems to be an impression among some of the horticulturists of this state that but little fruit can be grown in the arid section west of the big woods, but this is erroneous. We can grow as fine fruit here as can be grown anywhere in the state, and we shall soon demonstrate it. The Duchess and Wealthy have been our best paying apples and should be planted largely.

REPORT OF VICE-PRESIDENT, FOURTH CONGRESSIONAL DISTRICT.

R. S. MACKINTOSH, LANGDON.

Members of the Minnesota State Horticultural Society:

The strawberry crop in most parts of this district was rather light. At Afton, Washington Co., some fine berries were raised, but the yield was not large.

Raspberries and blackberries were about the average, if not below. Plums an entire failure here, and reports seem to indicate that it was general. Our plums are young. They grew well and, as the weather was favorable, ripened the wood well. I measured a few sprouts that were six feet long. We have planted the Desota, Weaver and Forest Garden, all doing well.

The Duchess apple yielded heavily this season. There are more of the kind planted here than any other, I think, and everywhere the trees were loaded. The market was good, so none were wasted. Other varieties gave various returns, some with fruit, but I think principally with blight.

When we have secured a few varieties of apples that will stand everything when properly cared for, then we shall find Minnesota one of the leading fruit states.

Grapes are not grown very much in this locality, but what few vines there are yielded quite well. The weather in the fall was very favorable for ripening. I visited one vineyard of several hundred vines that was very promising. (This was at the time when a few were just turning.)

I hope ere long we shall find more fruits and vegetables grown by our farmers; also more shade trees and windbreaks for protection from the fierce winds of winter and the sun of summer. Among the trees around our houses and in our gardens, let us find more flowers that are for enjoyment and pleasure, if not to appease hunger or fill the pocket book! These things will help solve the problem of making farm life better and pleasanter.

REPORT OF VICE-PRESIDENT, SIXTH CONGRESSIONAL DISTRICT.

MRS. JENNIE STAGER, SAUK RAPIDS.

Mr. President, ladies and gentlemen:

In the last few years the planting of trees, vines and small fruits has largely increased. As for apples, I, for myself, am quite discouraged. Out of over one hundred trees, I have only about five that are perfect, two of those being Russians. One of my Transcendents I was very proud of: about eighteen feet high and sixteen inches in circumference;

handsome shape; bark smooth and clean. It bore fruit almost every summer; but after doing well eleven years it was struck with blight last summer and I had to sacrifice some of its beautiful limbs. Last season one of my Russians bore just one apple, as large as a Spitzenberg, which I refrained from gathering so as to have it fully ripened to bring to this meeting. But while at church one Sunday a neighbor's boy passed everything else by and gathered that cherished fruit. To my sorrow two limbs of that tree were struck with blight. I have burned all blighted wood but that does not save the remainder.

As for small fruits the yield in our section was quite encouraging. Owing to plentiful rains, strawberries wherever proper attention was given them produced a fine crop of very large berries. The currants promised an extra yield the first of the season, but later a great many dropped off, thereby giving a medium crop, the Cherry and the common Red Dutch bearing best.

Gooseberries gave large crops, but were badly mildewed on many places I visited. The Industry has been planted by many, but has given little fruit yet and that not as large as was expected. On my place and many others the red raspberry bore enormously and brought fifteen cents a quart the season through, notwithstanding quantities of wild ones were brought into market. I had about made up my mind to exterminate the Snyder blackberries upon my grounds, so last fall did not lay them down, and this spring let them grow at their own sweet will. But, as it is the unexpected that happens, to my unbounded surprise they yielded a large crop of delicious berries. Most varieties of plums bore well. One large, wine-colored plum, nicely flavored, has blighted the last three years. It begins to turn brown in spots, which soon spread over the whole plum, eating through and drying up the pulp. As it is widely grown, we would like to know of any remedy other than cutting down. The Gregg is the best black raspberry we have, and generally gives a good crop.

Several of us, three or four years ago, planted a dewberry sold us as the Lucretia. It has been very thrifty as to leaves and vines, but has never shown a blossom. Grapes bore nicely wherever I found them planted, and ripened earlier than usual.

At Mr. John Dunewold's, Duelm, I found a beautiful orchard of young apple trees, most of them bearing, and, wonderful to relate, not one blighted. His place is bounded on one side by a forty-acre lake and on the other sides by heavy timber, and is a mile or more from any other apple trees. Perhaps, that is how he escapes the blight. Several years ago Peter M. Gideon of Excelsior sent me a hundred seedling apple trees. As my land was not in order, I gave them to Mr. E. Cross of Sauk Rapids. Most of them have done well. Seven of them bore apples of good flavor and about the size of a Hyslop, one, especially, tasting like a pear when ripe and keeping until May; another was almost as large as a Duchess, but a poor keeper. I believe Mrs. Cross has some specimens here with her. Twenty-five are budded for fruit.

Ten years ago I found very little fruit around the country except currants, a few gooseberries, crab apples and wild plums. Now, one can hardly pass a farm without finding several varieties of cultivated fruit, and we have quite a number of enthusiastic fruit growers, including Messrs E. Cross, Dunewold, Myers, Fogg, Clifton and several others, not excluding your humble servant.

FRUITS IN THE RED RIVER VALLEY.

E. W. HASELTINE, GRAND FORKS, N. D.

Mr. President, ladies and gentlemen:

Being requested by your worthy secretary, Mr. A. W. Latham, to write an article on "Fruits in the Red River Valley," I hope the society will not expect too much from an inexperienced writer, although I have had a few years experience in hardy fruit culture in this climate.

Coming here in 1879, when there was nothing to be seen but a vast prairie, dotted here and there with a small board or log cabin, it looked very discouraging to a new beginner to enter the vocation of a nurseryman, and raise forest and fruit stock for a country so near the 49th parallel.

First, I concluded to make a thorough investigation as to the kinds of wild fruit to be found, there being no tame varieties within 100 miles or more in any direction.

On the prairie was found in abundance the wild strawberry of fine quality and size; season, about two weeks later than in southern Minnesota.

In the timber along the Red River and its tributaries red raspberries, gooseberries, black currants, Juneberries and two varieties of plums were growing in abundance, constituting some of the best wild fruits of this section. These fruits were also found on the prairies in some localities, where they had escaped the prairie fires.

There were other varieties of less importance, such as grapes, bearing perhaps once in three or four years, depending on the season, and high bush cranberries, used more or less for jellies.

This investigation soon convinced me that I could succeed with small fruit with proper care on the prairie. By planting a windbreak around the plot intended for nursery or garden, there would be no trouble in raising all the hardy fruits that flourish in timbered sections of this latitude, other things being equal.

So we are able by our experience to give a short list of fruits that have been growing here in the valley during the past thirteen years, that have proved a complete success.

CURRANTS.—There need not be any discrimination as to variety to plant as all do well, only some seem to bear better than others, namely: Cherry, Victoria, Fay's Prolific and White Grape. There is one pleasure in raising currants here, we have not been troubled with insects as are sections further south.

GOOSEBERRIES.—The Houghton Seedling does well; the Downing and some other varieties tried need covering or they will winter kill to some extent. There is no complaint in this climate as to mildew.

RASPBERRIES.—We have tried a number of varieties and find the Philadelphia and Turner in red, and Mammoth Cluster in black, succeed the best. If covered in the fall with earth or coarse litter, we are quite sure of a good crop the following year.

BLACKBERRIES.—The Ancient Briton do best, but canes need covering with earth in the fall to save winter-killing.

STRAWBERRIES.—Many varieties have been tried; none so successful as the Wilson and Crescent Seedling. The Crescent is much the hardiest and best bearer, where planted along side of the Wilson. On plots from one to three acres I have found the strawberry the most profitable of all of the small fruits.

GRAPES.—Grapes have not as yet been a success, owing to continued growth of the vines in the fall and shortness of the season.

PLUMS.—If the trees are mulched in the fall and headed low, the Desota and Weaver will do well.

CRABS.—The Transcendent has done the best of the many varieties that have been tried, being free from blight in this locality. Next in hardiness comes the Hyslop.

Apples and cherries we do not consider profitable or a success, although I have seen good samples of Duchess, Wealthy and Tetofsky apples and Kentish cherry, in four or five counties in the valley. I am confident as the country grows older and with proper care (heading the tree low, mulching and cultivating), the hardy apples and cherries will be grown here with moderate success.

Our advice to farmers located on the prairie has been to first plant a good forest protection around the plot intended for the building and garden, then the small fruit and hardy crabs and plums will do well.

As yet, the wheat industry of the valley overshadows all other interests; but year by year the farmers are taking more pride in putting up good buildings and in starting groves and fruit gardens, as they become able. So it will be but a few years before the Red River Valley will compare favorably with many of the older settlements of southern Minnesota, as there are hundreds of good farm homes and small fruit gardens now in every county bordering on the Red River.

THE CROSSING AND HYBRIDIZING OF FRUITS.

PROF. N. E. HANSEN, AGRICULTURAL COLLEGE, AMES, IOWA.

This subject has of late years attracted much attention from western horticulturists, as being one of great practical importance. It is the key to the solution of many of our horticultural problems. The limits of this paper will not admit of an exhaustive treatment of the subject, but only of the brief discussion of some of the general principles and the most promising lines for future work.

HISTORY.—The history of hortlculture shows the wonderful results obtained by this method in improving flowers, grapes and some of the small fruits. Crossing and hybridizing may be regarded as a method of hastening the process of evolution by introducing new elements of variation; and it shortens very materially the time required for the development of improved varieties. With flowers, grapes and small fruits, results are speedy, and, hence, the workers numerous. But with the orchard fruits longer time is required, so accidental seedlings, with pedigree determined by insects and the wind, have satisfied the wants of the orchardist. But these varieties of the old list have proven worthless for the Northwest, so we need to breed new varieties for our peculiar soil and climate. And, as breeders of animals choose the parents, why should not breeders of plants do the same? The indiscriminate sowing of seeds is an expensive lottery. Let the example of the florists be followed, and results in developing fruits will be equally wonderful.

SELECTION OF PARENTS.—Over fifty years ago Lindley wrote: "Hybridizing is a game of chance played between man and plants." But the records now show that it is more a game of skill than chance. Workers

in improving flowers have found that in many cases all the seedlings resulting from crossing two distinct varieties or species were nearly or quite identical; and that new varieties identical in all respects could be produced at will by using the same parents. This explains the curious fact of the production of practically identical varieties by two or more experimenters working independently at different times and places.

The underlying principle in all these cases appears to be that each parent has its fixed degree of prepotency, and that the most prepotent parent controls the characteristics of the offspring. If both parents are of mongrel pedigree, and hence not prepotent, the progeny will be very variable, because the latent tendencies to reversion in both parents become united in the offspring. Hence, for best results we should use, if possible, a prepotent type for one of the parents, which has the most essential characteristic, viz: *hardiness.*

There are some interesting examples of this on the college grounds at Ames. Many of the east European apples run in families that come nearly true from seed, and the prepotency of such varieties has been evident when crossed with American varieties of mongrel parentage. The seedlings of Russian apples pollenized with American varieties are very uniform, looking much more like a row of root-grafts than a row of seedlings. They are Russian in leaf, bud, and habit, showing the prepotency of that race. The seedlings of American apples pollenized with Russian varieties are less uniform; while the seedlings of crosses of American with American varieties, both parents being of the west European type, are a scrubby, very irregular and unpromising lot of trees, both parents being mongrels with no fixity of type.

The evidence up to date in crossing fruits leads us always to select the female parent to impart hardiness and the male parent to impart quality and season of fruit.

The histories of Rogers' Hybrid grapes and Hovey's Seedling strawberry are good examples of hardiness being inherited from the female, and desirable characteristics of fruit from the male parent.

SELECT THE HARDIEST TYPE.

In selecting the female parent, the hardiest form of the species should be used. The boxelder of Virginia is as tender as a peach in Iowa, while the same species from northern grown seed is perfectly hardy. The race of apples from west Europe is tender here in the Northwest, while the race from east Europe has proved its vastly greater degree of hardiness. The silver spruce from the west slope of the Rocky Mountains is tender on our prairies, while the same species from the east slope is a model of beauty and hardiness. Eastern grown seed of our common forest trees is much inferior in hardiness to seeds of the same species from our nearest river bottoms. All these are examples indicating that care must be taken to choose the type of the species that is best adapted to our climate. Rogers' Hybrid grapes are not fully adapted to the Northwest, because neither parent is fully adapted to prairie conditions. So Rogers' work should be done over again for the far Northwest, using, if possible, the indigenous species for the female parent. The same is the case with the wild strawberry of the Eastern states. Progress in strawberry culture in the West was slow until Downer of Kentucky and others began to use the western type, from which to develop varieties better adapted to Western

conditions of soil and climate. Since that time progress has been rapid, and the new varieties, such as Parker Earle, Warfield and Bubach No. 5, illustrate the great advantage and importance of applying this principle. So for the far Northwest we should begin with the local type of the wild strawberry and improve it by using the pollen of our largest and best flavored cultivated strawberries.

INTERMEDIATE WORK.—In crossing species it may be that there is too great diversity in character between the parents; if in hardiness, the resulting seedlings will lack in that essential point; if too diverse botanically, the cross will be too violent, and the hybrids will lack in fertility. In either case, these first hybrids may be useful as *intermediate steps* in the work of development. By pollenizing the hardy species with these hybrids, the offspring will be of three-fourths hardy, and one-fourth tender pedigree. These secondary hybrids will probably be superior to those of the first generation, because of the nearer relationship of the parents.

As work in this line, we have pollenized Worden and other hardy grapes, not with European grapes as did Rogers, but with Agawam, Salem and other Rogers' Hybrids, thereby securing a smaller infusion of tender blood. We thus hope to combine hardiness and high quality.

METHODS.—The above is but a glance at some of the leading thoughts underlying the extensive series of experiments in breeding fruits, inaugurated at the Iowa Agricultural College in 1866 by Prof. J. L. Budd, and continued up to the present time.

In this connection it may be of interest to describe briefly the methods of doing the work. About twenty-four hours before the flower opens the stamens are carefully removed with a pair of fine forceps or pinchers, such as are used in botanical laboratory work. Part or all of the petals are removed to give easier access to the stamens. In practice, only the anthers are removed, leaving most of the filaments. For convenience, only two flowers in each cluster of apple, pear, cherry or plum blossoms are operated upon; the others are removed. Blossoms on a strong spur are preferred to those on the end of a limb. The blossoms are at once protected from insects and foreign pollen by means of a one-pound manilla paper sack, with bottom squared so it will stand on a level surface. Fine wire, such as is used for tree labels, is best for fastening the sacks. As soon as the stigmas are receptive, so that the pollen will adhere, which is usually the next day, the sack is removed, pollen applied with a camel's hair brush and the sack replaced. In a few days the paper sacks are replaced by sacks made of mosquito netting, so as to give access to sunshine and air.

Paper sacks are not fully satisfactory. We have found fine muslin sacks more reliable, especially in wet seasons. In case of wet or windy weather the paper sacks are liable to be torn, and, if not torn, they hold the moisture too long.

To save pollen the blossoms are gathered as soon as open, before the anthers have burst and discharged the pollen. The anthers are picked off with the pinchers, and thoroughly dried before putting in a small vial or cup or even in an envelope open at one end. A small vial is best. When thoroughly dried, pollen may be sent across the continent in an envelope. Keep in a dry, warm place. The same brush should not be used for more than one kind of pollen.

In crossing grapes I have found that the caps and stamens can be removed with much facility by using the tips of the fingers, also the pinchers. Also, that with the grape pollenizing can be done by taking clusters of bloom just opened and fastening them with string and fine wire in close proximity to the emasculated clusters. This is easier than gathering the pollen and applying with a camel's hair brush. Paper sacks are used at first and replaced later by mosquito netting.

PROMISING LINES OF WORK.

Some of the leading lines of work have already been mentioned. In crossing Russian and American apples the aim has been to secure iron-clad varieties of the highest quality for all seasons. The native wild crab is not as promising as was once thought, because it is much subject to attacks of the fungus diseases, scab and roestelia, from which the Russians are exempt; it is not hardy at the far North; and it sun-scalds when removed from the native thickets and planted on the open prairie.

In crossing pears our object has been to cross the hardiest of the east European varieties with those of the highest quality of west European parentage. A good beginning in this line was made the past season.

In crossing cherries the aim has been to pollenize the hardiest sour cherries from east Europe with the best sweet varieties; also to improve our native sand cherry (*prunus pumila*) and wild red cherry (*p. pennsylvanica*). In the past cherryless year we failed in our work with the latter two species, but the experiment is not abandoned.

In improving our native plums the object has been to obtain high quality by using as the male parents the best European and Japan plums. If the cross proves so violent as to affect injuriously the productiveness and hardiness, the same method will be followed as with the grape, viz., to use the pollen of these hybrid varieties on our wild plums, thus securing a smaller infusion of foreign blood.

Some seedlings on the college grounds of Desota, crossed with a large blue Japan plum grown in Oregon, show important modifications in foliage and fruit and are very promising.

The Northwest greatly needs a grape of good quality that is early enough to ripen even in North Dakota and Minnesota, and is perfectly hardy without winter protection. The past season we have crossed our wild grape with Empire State to determine the effect of using a variety of purely native parentage. Next season we will try to cross it with some of Rogers' Hybrids.

The gooseberry merits attention. The past season we crossed a hardy gooseberry from the Amur Valley in Asia with the Industry. The object is to obtain a hardy mildew-proof variety with fruit rivaling in size and quality the best English varieties.

The Northwest needs a good variety of raspberry hardy enough to bear well at the north without winter protection. With this end in view, we have the past season crossed a wild red raspberry from the Black Hills with the Shaeffer raspberry.

Our native hazel nuts, walnuts, and hickory nuts all merit our careful attention, as they are, no doubt, capable of vast improvements by crossing and selection. Especially promising is our wild hazel nut, as it would probably soon rival the best filberts.

Similar work remains to be done with our indigenous currants, Juneberries, blackberries, dewberries, strawberries and other fruits.

ROSES.

While not properly coming within the scope of this paper, it may be of interest to note that we are endeavoring to originate a new race of hardy double roses for the Northwest. All the varieties of *Rosa rugose* imported by Prof. Budd from Russia have proven perfectly hardy without winter protection; have large fragrant flowers and bloom all summer, but the flowers are single. It is a fixed species coming nearly true from seed. The past season we crossed them with a number of choice double roses, such as Gen. Jacqueminot, American Beauty, Magna Charta, Madam Masson and Triumph de Exposition, and we now have fully twenty thousand seeds put away for spring planting. Some work has also been done with other primitive species including our native *Rosa blanda*.

In conclusion, we may state that the systematic origination of new varieties may well be termed *fundamental* work in horticulture, and deserves our most careful consideration. Many workers are needed in this line, and we hope that many of the members of this society will aid in the work of developing hardy fruits and flowers for the Northwest.

SEEDLING FRUITS.

REPORT OF COMMITTEE ON SEEDLING FRUITS.

J. S. HARRIS.

Mr. President and friends of the Minnesota State Horticultural Society:

There is no one question in which the pomologists of Minnesota and the entire Northwest are at this time so deeply interested as that of finding varieties of fruit of the very best quality and covering every season of the year, that are sufficiently hardy to endure the rigors of the climate, and are adapted to general cultivation by our people. Every choice variety of fruit grown in the orchards and gardens of the temperate zone has been brought up to its present degree of excellence from very inferior types of wild crabs, pears, grapes, &c., through a long process of propagating and cultivating seedlings. By placing the plants under the best possible circumstances suggested by his intelligence, and by carefully selecting seed from the fruit produced in this way, and continual planting and cultivating, saving only the best, the ameliorating and improving of varieties has kept pace with civilization, and man has in a long series of ages obtained the many improved forms that are now so universally cultivated. By slow degrees the sour and bitter crab has expanded into the beautiful red-cheeked Pippin; the wild, thorny and scarcely edible pear into the mellow Bergamot or Beurre Diel; and the bitter almond into the delicious juicy peach. Many other species have improved in about the same ratio, and the greatest improvement has invariably taken place in the face of the greatest obstacles and in places where nature was not prodigal of perfections.

In the whole range of the field occupied by the horticulturist there is nothing more important and interesting than the originating of new varieties, and it is doubly interesting to the horticulturist of our state from the fact that varieties originated in a certain soil and climate are nearly always found best adapted to that locality. Repeated trials of the varieties of apples and their seedling descendants from the west of Europe and the older states have convinced us that they will not succeed here. Owing to the confusion of names and the uncertain quality of many of the varieties recently introduced from Russia, they have been but imperfectly tested and have not advanced very rapidly in public favor; and our main hope now seems to lie in the originating of new varieties from seed and creating a pomology of our own. I am glad to be able to report that we seem to be making considerable progress, and that the outlook is very promising. During the months of August, September and October, as a field agent of the Division of Pomology, U. S. Department of Agriculture, I was offered an opportunity to explore about a dozen counties of the state and visit several fairs. The result is that I have found in every county a deep and growing interest in fruit culture, and discovered a considerable number of seedlings not heretofore

brought to public notice, several of them comparing well in size, quality and appearance to the Wealthy, Duchess and the best new Russians. Their comparative hardiness can only be ascertained through propagation and through trial in different localities. In order that they may be placed on record for future reference, I append brief descriptions of a few of the most promising: they will necessarily be imperfect, as in some cases the fruit was picked before fully mature, and in others I had only a single specimen for examination; besides, the season may vary considerably. Winter apples seem to have ripened prematurely this year.

P. D. ANDERSON, SEEDLING, CARVER CO: - Size 5; form flattish round; color yellow, mostly covered with bright red and thickly sprinkled with fine gray dots; stem medium short, elastic, set in a broad regular greenish-yellow cavity; calyx half open in a broad, medium deep, corrugated basin; flesh yellowish-white, fine-grained, firm; flavor subacid, sweet; core small, closed; season, winter. The tree was found growing in a hedge row near Waconia, is thrifty and shows marks of hardiness.

ANDREW PETERSON, No. 5:—Size 5; form round, slightly angular; color yellowish green, striped with red; stem short, in a rather small cavity; calyx small, partly open, set in a broad, shallow, much wrinkled basin; flesh yellow; flavor subacid; core medium; season, October, December. Originated from seed of Lieby.

O. M. LORD'S SEEDLINGS OF THE WEALTHY, No. 1 (Longfield):—Size 3; form, round; color greenish-yellow; shaded light blush and striped with red on sun side; flesh white, shading red on sun side, fine grained, juicy tender; flavor pleasant acid; stem long and slender; cavity narrow; calyx small, closed in a medium deeply wrinkled basin. Season, November and December.

LORD'S No. 2:—Size 4; form round conical; color yellow, striped and splashed with red; stem long, medium, stout, set in a narrow, deep russetted cavity; calyx closed in a narrow corrugated basin; flesh white, fine-grained, juicy; flavor sweet. Season, October and November.

LORD'S No. 3, (B):—Size 5; form roundish, flattened at the ends; color green, lightly striped with dull red; flesh yellowish, firm; flavor subacid; stem long; cavity broad; medium deep calyx, small, half open in a broad slightly wrinkled basin; core small and closed. Season, apparently December to February.

NORWAY OR T. JOHNSON, No. 1:—Size 5 to 6; form round conic; color, yellow and deep red striped, thickly sprinkled with large white or gray dots; flesh medium fine-grained yellowish-white, often stained red; flavor pleasant aromatic acid; stem, medium long in a deep angular russeted cavity; calyx closed basin, shallow, wrinkled; core small and close Season, December. Originated in Houston Co. from seed from a Norway tree about 28 years old; broad spreading habit.

T. JOHNSON, No. 2: Size 6; form smooth, round; color greenish-yellow, striped red; stem medium; cavity broad and russeted at the bottom; calyx partly open; basin medium broad, slightly wrinkled; flesh yellowish-white, fine grained, crisp, pleasant acid; season, October and November; as fair in appearance and better in quality than a well grown Oldenburg; tree, 16 years old.

AMES SEEDLING, MOWER CO: Size 4; form conical; green and red striped, becoming mostly red when fully matured; stem short, in a rather

broad, shallow cavity; calyx closed in a small, shallow basin; flesh green, a little coarse; flavor acid; use kitchen; season, late winter; tree annual, a profuse bearer.

HUME'S SEEDLING, FARIBAULT CO: Size 5; form round; color light yellow when fully ripe and showing many whitish dots under the skin; short stem, in a slightly irregular greenish cavity; calyx partly open; basin deep, angular, the angles extending well out into the sides of the fruit; flesh yellow, fine-grained, juicy, rich, subacid flavor; season, November. We should estimate the hardiness about same as Wealthy, while the quality is better; may prove valuable topworked on hardy stocks.

CAMPBELL'S SEEDLING, NO. 2: Size 4 to 5; form round conic; color clear yellow, striped with light red; stem medium in a broad, deep, striped cavity; calyx open; basin small, wrinkled; flesh nearly white, a little coarse-grained, juicy, subacid, sweet flavor; use dessert; season, October; tree 17 years old, strong upright grower.

CAMPBELL'S NO. 6: Size 4 to 5; form roundish; color straw yellow; flesh, yellowish-white, fine-grained; flavor sprightly, subacid, good; stem medium, set in a rather broad, medium deep, greenish cavity; calyx small, closed, set in a broad, rather shallow, wrinkled basin; core, medium, closed; season, September; use, table and market.

CAMPBELL'S NO. 8: Size 4; form round, oval; color yellow, striped light red; stem short in narrow cavity, calyx closed in a shallow basin; core medium; flesh yellowish, tender, juicy subacid; season, October.

CAMPBELL'S NO. 9: Size 5 to 6; form roundish; color yellow, thickly studded with greenish dots; stem long and slender, in a deep russeted cavity, rays of russet often extending out on the sides of the fruit; calyx partly open in a broad wrinkled basin; flesh yellowish-white, fine-grained, juicy subacid; season, October.

CAMPBELL'S NO. 11: Size 4 to 5; form round somewhat flattened at the ends; color light yellow and red striped; stem short; cavity, small; calyx open on a nearly flush corrugated basin; flesh nearly white, shading red, fine grained; flavor pleasant acid; season, October.

LACQUA SEEDLING, WABASHA CO: Size 5; form flattish round; color greenish-yellow, mostly covered with red stripes and splashes and thickly covered with fine gray dots; stem stout, medium long in a broad medium deep cavity, green at the base of stem; calyx small, partly open in a medium corugated basin; flesh greenish-white; flavor subacid, only fair; season, December; from seed of Oldenburg.

SELEE SEEDLING, FILLMORE CO: Size 5; form round; color pale yellow, splashed light red and striped deeper red; stem short, in a narrow deep green cavity; calyx closed in an abrupt corrugated medium deep basin; flesh nearly white, fine-grained, fine subacid flavor; season, November and December. Tree 25 years old produced three barrels of fruit in 1892. I have not been able to visit and examine it yet.

WALKER'S SEEDLING, SPRING VALLEY: From sample received by mail. Size 6; form flattish round; color greenish-yellow, nearly covered with stripes and splashes of red; flesh yellow; flavor subacid; stem short; cavity broad and shallow; calyx open; basin deep; season, September; from seed of Oldenburg.

In addition to the varieties described above we have found numbers of seedlings in about every county visited. In Houston county there are some eight or ten more showing some considerable merit. In Fillmore, besides the Kruyels, some half dozen; in Freeborn three; in Faribault seven or eight; in Martin about three; in Winona three or four; in Wabasha four; Rice a dozen or more; Hennepin six or eight; McLeod two. Besides these we have heard of one in Nobles county, several in Blue Earth county, one in Renville county, one in Kandiyohi county, and a few in Goodhue county. Some of these are likely to prove as good or better than those already described. We have noticed that seedlings known to be of the Oldenburg very generally show large healthy foliage and comparative freedom from blight, and that a considerable proportion of them produce fruit of average size and fine appearance; that the season varies from August to December, and that the flavor of some of them is finer than the Oldenburg, those supposed to be crossed with the Haas being the poorest. These facts are encouraging; and may we not have reasonable grounds to expect that seedlings from these and from the longest keeping, most hardy varieties of the newer Russians will at no distant day give us hardy varieties adapted to our climate that will meet our every want? Among older varieties mentioned in former reports the Peerless, Patten's Greening, Okobena, some of the Krugels, and the Catherine are apparently doing well.

APPLES.

REPORT OF COMMITTEE ON APPLES.

CLARENCE WEDGE, ALBERT LEA.

A year ago in a conversation with Prof. Green, he surprised me by remarking that he supposed that I was rather discouraged about raising apples, but that he hoped I would not give it up. I had supposed that my horticultural acquaintances all understood that I was considerable of an enthusiast on the subject of orcharding. I think I will make my position understood when I state that were I given the choice of my location in America to plant an orchard for profit I should choose southern Minnesota. I should choose it, not because the location promises fewer difficulties or discouragements than others, but mainly because to the average planter, and especially to the planter of the old school, it does offer discouragements of the most forbidding type. For the very reason that apples do not grow spontaneously with us and that we are at the threshold of a region that can never raise them, we are assured of that most important adjunct of an orchard, a market, and that best of all markets, a home market. And, moreover, those who plant orchards now will have a monopoly of the home market, for there are no orchards, and none are being planted in that section. True, there are little fruit gardens of an eighth to half an acre planted and being planted to an ill-assorted mixture of varieties; but in the modern market they can never compete with the grower who has twenty or ten or even one acre of one variety and knows how to handle it.

But I would scarcely think it safe to attempt orcharding by the old methods. I should place little dependence on twenty-year-old trees or, indeed, altogether on my trees alone. I should plant varieties that are known to make good returns before the trees are set ten years, and should plant in such a manner that my crops of potatoes, corn, beans and clover on the land would be about as large and as conveniently produced as if the trees were not there. The two ideas of early bearing varieties and supplementary crops are, in my humble judgment, to be the first principles of successful orcharding in Minnesota. In order to accomplish this, the old fashion of planting in hills must give place to the new of planting in drills. From forty to sixty feet is not too far to place the rows apart, and from eight to twelve feet will not be too near to set the trees.

Wealthys have been set in Freeborn county for twenty years, but the largest now living would not be crowded if set in such rows eight feet apart, and yet I am inclined to class the Wealthy as one of our profitable varieties. The Duchess and Hibernal, being longer lived trees, will require about twelve feet. The rows must run north and south, and the trees set leaning to the one o'clock sun; if three or four-year-old trees are set, the inclination will be permanent, and, probably, a little time gained

over two-year-old trees. As to length of stem, I am not an advocate of the no stem theory, but am open to conviction. It may be necessary to grow the Wealthy as a bush, but topworked three feet high on Virginia. I believe it would be equally hardy and much more conveniently protected from rabbits and less likely to be broken down by drifting snows.

The choice of varieties is a matter of prime importance, but, unfortunately, one upon which the doctors must cordially disagree. In the past the Duchess has been the most profitable, and with the general adoption of cold storage seems likely to be one of the best for the future. In southern Minnesota it is reliable in hardiness, as is witnessed by thousands of old trees standing in perfect health. I am under the impression that severe thinning of fruit to change the year of bearing from that of the common orchards, thus securing fruit in the off years, would be a very advantageous policy.

The Hibernal (I mean the entire family, including Recumbent, Juicy Burr, Pendant Ear, and Silken Leaf) is, probably, the next most reliable variety. At the late northern Iowa meeting it was repeatedly declared to be twenty per cent. hardier than Duchess, and no one was heard to dispute. It is noticeable for its early and heavy bearing. Trees in my orchard, five years set, have already paid first cost and all expenses, indeed, have brought in about as much money as Duchess nine years planted. Careful investigation and observation among the orchards from Minneapolis to central Iowa lead me to the belief that I can serve the fruit interests of the country no better than by urging the merits of this variety. J. C. Ferris aptly calls it "The Ben Davis of the North." While it does not monopolize all the pomological virtues, it will, if given the opportunity, afford our people an abundance of apples up to the first of January, and will extend the region of profitable orcharding a hundred miles or more to the north and west. It is, fortunately, a variety commonly found in the nurseries, and I am advertising no monopoly in publishing its virtues.

The Longfield is not a variety of great hardiness, but it is to-day perhaps the safest variety to plant for sale as a dessert apple. It will bear a bushel of apples a little quicker than any variety I know of, and although a little undersized is quite handsome and about as good in quality as Wealthy. The Wealthy is commonly considered an early bearing variety. With me it has borne a few specimens about as soon as any, but it has taken double the time to carry a crop that it has the Longfield. There has been so much evidence brought to show the advantage of topworking that I should favor setting the Virginia crab and Hibernal, and topworking them with either Wealthy or Longfield, with a strong leaning in favor of the latter. As an all winter variety the Malinda is attracting much attention. Were it an early bearing kind I would think it valuable in spite of its half-hardiness, but life is too short and our climate too uncertain to admit such a variety into the commercial orchard.

Whatever varieties are planted or methods employed we must expect a larger loss of trees than the Eastern orchardist. Periods of wide-spread disaster, as in '84-5, will doubtless again overtake us; but if to the compensating advantages of exemption from insect pests, superior beauty, quality of fruit and nearness of market we add the use of early bearing

varieties and supplementary crops, we can with good heart hastily fill up our vacant ranks of trees, knowing that the disasters that overwhelm the many will bring to faithfulness and courage the richer reward.

DISCUSSION.

Mr. J. S. Harris. I coincide with Mr. Wedge on the varieties named, but I should go very slowly with the Malinda except as a topworked tree, and then put in only a few for the young children to teeth on. (Laughter.) I hope that in the future we may get a good long-keeping apple.

Mr. Murray. There is one point he mentioned, and that is in regard to the distance he said he would set the trees from each other. It struck me that the distance he named between the rows was surprisingly wide, as was the distance in the rows.

Mr. Wedge. Of course, there are many other good orchards in that part of the state, but they do not supply the markets of the state by any means. I think the distance named in my paper is a good distance, as my idea is to get a good crop of corn and potatoes off the land anyhow, and then I propose that those rows of trees shall bring me in something besides.

Mr. Harris. Apple trees are not a success if they are placed too close together. Of course, when they are small it is all right, but when they grow larger the difficulty appears. Mr. Wedge and I talked that matter over last fall, and my advice to him was to set the trees at least forty feet apart—and I guess sixty would have been better—letting the rows run north and south or a little northeast and southwest, and then plant the trees closely in the rows, according to the varieties. I know that some trees starve to death in Minnesota because they are set too close together and, consequently, have no vitality to resist severe climatic influences. Now, these wide rows give the trees an opportunity to draw more nutriment from the soil, and also allow us to go between them with our teams in the winter and unload manure.

Mr. O. F. Brand. I would like to ask Mr. Wedge how many varieties he has in his own orchard, and if he noticed much injury to the foliage last summer?

Mr. Wedge. I have probably about twenty-five varieties. I remember there was considerable injury to the leaves in July or about that time. I do not know what it was—the leaves curled, or something of that kind. I could not place the injury.

Mr. Brand. Were there spots on the leaves?

Mr. Wedge. Oh yes, there were scabs in my orchards a good deal, too.

Mr. Brand. Can you name any one variety that passed through in better condition than the others?

Mr. Wedge, Well, almost anything Russian was all right so far as the scab was concerned. The Peerless was the only one in my whole orchard that was absolutely perfect as regards blight. In other respects I don't know that it fared any better than the Russians did.

REPORT ON APPLES.

R. C. KEEL, ROCHESTER.

Mr. President and members of the Minnesota State Horticultural Society:

LADIES AND GENTLEMEN:—The year of 1892 has been one of great encouragement and also of some disappointment to the fruit growers of Minnesota. The trees came through the previous winter in good condition, and in the spring it looked as though we would have an abundant crop of all kinds of apples and crab apples, but the wet and cold spring and then a couple of very hot days, June 10 and 11, I think it was, did some damage to the blossoms and caused the crab apple trees to blight; also some of the Russian trees were hurt, more so in the middle and western part of the state than in the southeastern part.

But after all, we had a large crop, the largest that was ever grown in Minnesota, and the farmers in our part of the state who have orchards are bound to have some more trees in the spring; they have found out that one acre of orchard pays better than 20 acres of wheat. The cry we used to hear, "Will Minnesota ever raise her own apples?" was solved in 1892, and is now a question of the past.

The commission merchants in this city and in St. Paul have also commenced to notice the importance of the fruit industry in Minnesota. The bulk of apples raised in our state is, of course, Duchess, but the day is not far distant when we shall raise as many winter apples as we do of Duchess now. It will, probably, astonish the members of this society when I say that in two townships, namely, Haverhill and Viola, were raised 15,000 bushels of apples in 1892. They were shipped to Chicago, St. Louis and a great many to Dakota, and, when handled as they ought to be, brought a good price.

It is my honest belief that there is not a farm in Minnesota but what a small place could be found on it that would grow apple trees of some kind, but for commercial purposes the best locality should be looked up. Last year I raised 3,500 bushels of apples. I do not deny that I have a good location, but in our county we have thousands of acres that are as well adapted to fruit trees as my place is, and a great deal of it is even better; some of my land is of so poor quality that it will not even raise weeds, and yet it raises good crops of apples.

Now, I do not wish it understood that I advise people to plant their apple trees on the poorest soil, for it is a well known fact that the better the land is the better the crops will be. I had one-quarter of an acre planted with Wealthy trees that I mulched very heavily a year ago this fall;the result was that I picked from that orchard 65 barrels of apples. If

they could all have been hand-picked they would have brought me nearly $300; but we had a quite heavy wind storm just when we were picking them and when they were quite ripe; consequently, a great many of them dropped, but I sold none of them for less than $3.75 per barrel. With such a crop and prices, an acre of land would turn out about $1000.00. This statement, big as it may seem, is true, and can be proved by my pickers; and the orchard was seen by several members of this society, namely, Prof. Green, Sec. A. W. Latham and Mr. Somerville.

We have a few new varieties of apples which I think are worthy of notice, for instance, the Gilbert. I like this variety better, the more I get acquainted with it. It is only a fall apple, but keeps quite a long time and is not ripe till after the Duchess are gone. It is an annual and heavy bearer, good size and of excellent quality. The trees seem hardy and make a good growth although they bear so heavily. The seedling that Mr. Somerville has on exhibition is also one of great promise as a winter apple. The tree Mr. Somerville sold me is about 10 or 12 years old and hardy. Last summer it bore a heavy crop of fine apples: do not know as it ever bore before.

These are about the only new varieties that I know of in our county that are of any value; we still stick to the older varieties, such as Oldenburg, Wealthy, Longfield, Malinda and a number of Russians which seem to be doing well.

DISCUSSION.

Mr. Harris. This apple which Mr. Keel calls the Gilbert and another apple a good deal like it, that he called the Ostrekoff, he sent for to the Department at Washington. He sent most of the specimens to Professor Budd, and he said that either of them were splendid fruits to come in and succeed the Duchess. You know there are a great many mistakes made in sending out those Russian apples by the Superintendent of Agriculture, and, probably, nine out of ten of them are improperly named to-day, hindering us greatly when we get a good variety by making it almost impossible for us to find out the name, so that we can order more of the same kind.

Mr. Clarence Wedge. We are fortunate to-day in having with us a representative from our sister state, one who is able to instruct us on the subject of orcharding and apples, a gentleman whom it has been my pleasure to know for a number of years and whose friendship I especially value. He has been many years engaged in very careful painstaking experiments, and I want him while he is here to tell us something of those experiments. He is the originator of an apple which I think is going to prove a blessing to Minnesota. In northern Iowa there is nothing in the apple line more thoroughly endorsed than Patten's Greening, and I hope Mr. Patten, its originator, will step forward and favor us with a little talk on it and on the subject in general.

Mr. Patten. I do not believe that I have very much to offer at this time. Your discussion of the apple question interests me very much, of course, as I have long been engaged in this branch of horticulture, as Mr. Wedge has stated. There is one criticism I would like to make on Mr. Wedge's suggestion about setting out trees eight feet apart. I think twelve feet for a Wealthy even should be near enough, and I will give you my reasons. If your trees are planted anything like eight feet apart, and there should come on two or three dry seasons in succession or the summer should be succeeded by an exceedingly dry fall and an early cold winter, the trees planted so closely together would soon exhaust the moisture from the earth, and then they would suffer and perish, unless extra effort was made to supply them with the needed moisture. They would have to be watered or very heavily mulched, and, in any event, trees planted as thickly as that would suffer. I would consider that twelve feet would be a reasonable distance, and then if a dry season or a dry fall should come they would have to be watered and heavily mulched in order to carry them through the winter successfully.

From my own experience I would recommend that the Duchess of Oldenburg be not planted nearer together than sixteen or eighteen feet in the row. They live so long and bear so abundantly and require so much nourishment and sunlight, that they do not succeed as they would if they had a little more room. These are observations I have made during my efforts in this line, and I think they are important. I heartily concur in the distance named by Mr. Wedge between the rows. It gives thorough drainage, and to varieties subject to blight it would be of incalculable benefit; it also gives an opportunity to scatter the manure through the orchard.

In reference to the different varieties that suffered during the past year I would name the Longfield and Charlamoff, both of which suffered a great deal; and quite a number of Russians suffered to some extent. They scabbed some, and the Charlamoff bore very little, the Longfield bearing more but scabbing considerably. Now, here is a good opportunity to say a good word for our own native productions. As is well known to my friends, Mr. Wedge and Mr. Harris, I have a great number of seedlings on my grounds of varieties that are especially valuable for their hardiness in this western country. Very many of these seedlings have proved themselves of value this year, and without desiring to boom the Greening apple, for that has gone beyond

anything I might say for it, having fruited in four states now, I will say that tree was more perfect than any other tree I had on my grounds, without any exception—that is of the old bearing trees.

Mr. Wedge. Allow me to say that Mr. Patten's grounds are very trying in many respects.

Mr. Patten. I was about to say that the Greening bore a heavier crop this year—the old tree is now twenty-three years old—than any Duchess of Oldenburg on my grounds of anywhere near the same age, and carried its crop to maturity in perfection. There is another feature about the Greening that will interest all horticulturists, and that is, that even when it bears a heavy crop of fruit it has the vigor to make at the same time a large growth.

Professor Green: I would not like to see Mr. Keel's paper passed by without more discussion. I visited his place last summer. It was in September, at the time of the state fair, and he then was picking his Duchess, and it was a very encouraging sight. I never saw trees so heavily laden with apples as his trees were there. He had the Duchess, the Wealthy, the Longfield and the Gilbert, and they were very heavily laden. His orchard of Duchess apples is planted in rows twelve feet apart each way, and the trees have now grown close together, so that they form a complete canopy over the ground, bearing an immense crop of apples. His Wealthys were in perfect shape. I thought the best ones were those that were top grafted on the Beacher's Sweet crab and other crabs. The apples on the Longfield hung in great profusion on the branches all through the rows, and the trees themselves had also made a good growth of wood. They also were top grafted on the Beacher's Sweets. The location of his orchard is high, and the land is somewhat clayey, but it is no better than thousands of acres of land, I think, in that immediate vicinity.

President Underwood: We would be very glad to hear from Mr. Mitchell of Cresco, Iowa, who is with us to-day as a visitor from the Iowa society, and have him participate in our discussions. We hope that all of our visitors from outside the state, as well as in it, will consider themselves perfectly at home with us.

Mr. J. B. Mitchell, Cresco, Iowa: I was with you at the meeting held at Owatonna, and I made a few remarks in relation to seedlings there. I did not say what I intended to, nor what I wanted to say. I am not much of a speaker, and at that time I

had been sick, and, in fact, was sick when I was at your meeting, and, therefore, probably, did not make my meaning clear. I wish to correct the remarks that are credited to me in last year's report, and I have put that correction in the form of a short paper, but I did not intend to read it at the present time, if I did at all, as I did not expect to be called on to speak here. It is true I have had a good deal of experience in apple culture. I have been cultivating these Russian apples a long while, and if it were not for them I should be out of the business. I have tried all the more hardy varieties of the American apple, and I have had such bad luck with them in killing off, that I gave it up and fell back on the Russian apples, which I have been trying for some years. They have been a great success with us. Of course, there are many varieties among them that are entirely worthless, but I think one of them, the Lieby, is worth more to our state many times over, as I said a few years ago at our state meeting, than the Duchess, from the fact that the Lieby is a better keeper. I have also considered the tree twenty per cent. hardier than the Duchess, and it has borne as heavily with me as the Duchess, and is free from blight. This year, while the crab apples and the American varieties scabbed very much, the Lieby bore heavy crops of smooth apples, free from blight or scabs, either in leaf or apples. I can see no difference between the Lieby and the Hibernal, either of the trees or fruit. All my trees are grown from root grafts. I have always contended that in our part of Iowa we want trees hardy from the ground up.

Professor Green: What other apples besides the Lieby do you think highly of? Have you the Longfield?

Mr. Mitchell: I have not the Longfield. I have something over a hundred varieties. The Bergàmont is a fine apple, and the 444 is a good market apple.

Professor Green: I would like to ask Mr. Patten in regard to the Good Peasant, as to its health?

Mr. Patten: It is a good tree and I think very highly of it. It does not blight at all. The apple will keep, if properly handled, until December.

Mr. Patten followed with an interesting talk upon a number of imported varieties.

President Underwood: We have with us to-day Mr. William Somerville who is an authority on tree planting, and we would like to hear from him.

Mr. Somerville: I came here more to take notes and to listen than to talk myself. I will say that in 1862 I set out fifty Duchess apple trees sixteen feet apart each way, and if I were to set out fifty thousand more that is the distance at which I would set them. I want the whole ground occupied and I want it shaded, when the trees get large. A great many of us set our trees here in Minnesota with the expectation that one out of ten of them may live, and the balance of the ground will be cutivated for other purposes. I think that is wrong. We can afford to take better care of a small piece of ground, and thus insure our trees living, than we can of a larger one, if they are scattered too far apart. Of the fifty trees that I set out in 1862 there are forty-nine of them living to-day. I have not failed to get a crop of fruit for twenty-five years. The fiftieth tree overbore itself and broke down. My orchard occupies a space of ground about nine by thirteen rods, and it is the most profitable piece of ground that I have on my farm.

I believe it is necessary to feed our trees as much as it is to feed our stock. In the first place, we put on the mulch in the winter, and that retains the moisture in the ground. In the next place, the ground never freezes so hard when it is mulched. There are more trees starved to death than killed by severe winters. The roots are kept cool and moistened by this mulch, and our trees are not subject to blight as they are when the sun has licked up the last particle of food in the way of moisture that the trees can get at. I believe it is an advantage to do this, and I have found by doing it that I have very little blight in my orchard. I have a number of Russian apple trees that have done well. There are a number of our seedlings that are good fruit trees. There is no doubt that we have taken a step in the right direction in this matter of seedlings, and when we get two or three generations of these seedlings we will be right at home in raising apples in Minnesota. I am satisfied that we are increasing our yearly crop of apples in this state quite rapidly, and I believe that we shall continue to do so. Of course, whenever we leave the corn belt we do not talk about raising apples, but wherever we can raise corn we may be sure of success in raising apples. Now, there has been a great deal of talk made in regard to locations for orchards, but I do not think that either Mr. Keel or myself has any better location than other people. It is largely a matter of care and good judgment. (Applause.)

Mr. Smith: Isn't it a fact that there is a great difference in the character of the soil?

Mr. Somerville: Of course, there is some difference in that, but any disadvantage in that line may be overcome by taking proper care.

Mr. Pearce: How thick do you put your mulch on?

Mr. Somerville: Thick enough to keep off all the weeds and grass around the trees. Then I turn my pigs in and let them eat up all the grubs and worms.

Mr. Cook: Would you recommend manure on young apple trees that have not borne any yet?

Mr. Somerville: I use it on my young trees, well rotted, and as soon as they come into bearing I cease cultivation, and do the balance of the cultivation with my pigs and the mulching.

Secretary Latham: I have taken the ground that in our part of the state, at least, an orchard was a temporary thing, and was not going to live forever, and that whatever you get out of it will be only for a limited number of years. It is not possible for me to conceive of an orchard near Lake Minnetonka like the one Mr. Somerville has spoken of. Of course, if you are sure that you can raise trees that will live forty or fifty years, it will do to plant them so as to shade the ground the way he states, but at the lake we don't have any such longevity in our apple trees and we find it quite an advantage to plant the rows a good ways apart so that we can cultivate the ground easily, and plant them a little closer together in the rows. That gives an opportunity to raise a crop of small fruits on the ground. If the trees are planted too close together you cannot cultivate the ground easily in raising this small fruit. There is no question but what you raise a finer crop of fruit on cultivated ground. The crop of small fruits that we get off that land is practically what we should get if there had not been any trees planted there. It makes a very profitable crop, I am sure

President Underwood: I would like to hear Mr. Hawkinson say something about his apples.

Mr. Hawkinson: I plant my trees in rows about twelve feet apart and I put them about sixteen feet apart in the row. When they get thick enough I cut them out.

Professor Green: I think it a point well worth remembering in connection with topworking that the Virginia crab is one of the best stocks we have. It is a very free grower and the Wealthy does particularly well on it.

HARDY APPLES FOR THE NORTHWEST.

R. C. KEEL, ROCHESTER.

Mr. President and members of the State Horticultural Society of Minnesota,

LADIES AND GENTLEMEN: Our worthy secretary has asked me to write a paper on apples. Now, this is a quite broad question, as all varieties do not do equally well on all soils or under the same treatment; but I will give the names of a few varieties that, from my own experience and careful observation, are doing well in my part of our state.

The varieties that I will name are known to most of you; they are not new, some of them very old, but have been neglected.

The Duchess, Glass Green and Charlamoff are good summer and early fall varieties, and are a success nearly all over the state where they have been planted. For late fall and early winter we have the Wealthy, Longfield and others that will keep till Christmas or later. When they are gone we have the Malinda, Rollin's Russett, Rollin's Prolific and a number of Russians, such as Hibernal, Lieby and Red Queen. These will keep till late in the spring. These few trees are all doing well in our part of the state, and until I am convinced that we have something better I shall not discard them.

So much as to varieties. I will now give you an idea of how apples should be handled, so that they will bring the most money. It is a sad thing to see the hundreds of bushels of nice apples raised in our state go to waste when there are so many new settlers in the western part of our state and in the Dakotas, who suffer for want of fruit. We find it but little difficulty to raise Duchess and crab apples, but when it comes to handling them with profit it is a different matter, altogether.

Of course, crab apples do not require so careful handling as Duchess, but they should be picked before they are really ripe, never putting more than one variety in a barrel. Market for apples should be looked up beforehand, and as soon as they are picked and in barrels, they should be shipped.

In handling my Duchess, I take my barrels to the orchard, new barrels; I do not use anything else. I have found that it does not pay to use old dirty barrels. New barrels can be obtained from twenty-five to thirty cents a piece, and apples will bring about fifty cents more per barrel than when they are packed in old ones. My pickers get instructions before they commence, that they must handle the apples as carefully as if they were handling eggs. Each one is supplied with two half bushel baskets and a step ladder; they pick the apples clean from the trees and bring them up to the packing place. There I have a man, generally one that I can depend upon. He takes the full baskets and sorts and packs the apples; places the first layer in the bottom of the barrel with nice, even-sized, and good-colored apples, stem down. He handles every apple by hand. I do not allow him to pour the basketful into the barrel. After the barrel is full, a little above the rim, I have another man who heads it up; after that is done he turns the bottom end up and puts on my stencil and the name of the variety. No poor fruit should be allowed in the barrel; the reputation has much to do with getting good prices. The windfalls and those that are shaken off in picking are picked up at once and sold for what they will bring.

Last season I sent hundreds of barrels of Duchess to this market, that had been kept four or five weeks, and got a top market for all of them. It is not the over-production of apples that brings the market down every year, it is the careless handling and the shipping in old, dirty, broken-up barrels. I have often noticed farmers coming into town with a load of apples, hand-picked, they would say, but they were poured from a basket or a pail into sacks, boxes or barrels and then hauled in a lumber wagon ten or twelve miles. When they got to market they were not in condition to ship, but had to be pushed for anything they would bring. Such goods are a drug on the market, and it is about time for farmers and other small growers to look into these things and learn to handle their produce in a proper way.

DISCUSSION.

Mr. Wedge: I am greatly impressed with the value of this paper and with the need of our discussing and looking into the methods of handling our apples, now that we have learned we can raise them. I was disgusted and almost disheartened when I saw the careless handling that our wonderful crop of apples received this year in our own county. I know that the loss consequent upon that slipshod way of handling the fruit was not less than twenty-five per cent., and I think it may have been nearer to fifty per cent. We received on an average for our Duchess apples there fifty cents a bushel, we might just as well have received seventy-five cents, if they had been properly handled. They were handled largely in common grain sacks, but if they had taken the precaution to handle them in baskets or barrels they would have been rewarded by the extra price paid for them. They were also handled roughly in the picking. I would like to ask Mr Keel his method of picking, and what kind of a basket he uses, and also what method he has of packing them.

Mr. Keel: We use a common market basket that will hold about a half-bushel in picking them. It is held in the hand or hung on the top of the step ladder. I agree with Mr. Wedge in what he says about careless picking and handling. My Duchess apples averaged me about ninety cents a bushel last year. I sold most of them at three dollars a barrel on the track right in Rochester.

Mr. Goodell: I live up in the northern part of the country where we cannot grow many apples, but we used to try to grow them and we had quite a successful method of shipping them. We used a little lever that pressed the cover down upon the barrels, setting the apples together firmly and preventing them

from becoming bruised in their shipping. They always brought a good price because they opened up so well when they got to market.

Mr. Keel: A barrel must be more than full when it is headed up; then the apples will not shake around and come into market in bad condition. I have a press that I force the head of the barrel down into place with. In my arrangement a man can head up a good many barrels in a day.

Mr. Sampson: I am very glad that the subject of handling and shipping fruit has been brought up, for there is nobody more annoyed than the growers of small fruits in getting their fruit to market. I have often shipped cases of strawberries in splendid order, that were unfit for sale when they arrived at their destination because of the rough handling they had received on the way. I think the growers of small fruits should take concerted action in this matter and insist upon the different transportation companies giving proper attention to the careful handling of their fruit.

APPLE TREES FROM SEED.

J. B. MITCHELL, CRESCO, IOWA.

Members of the Minnesota State Horticultural Society:

At your last winter's meeting I made a few remarks on farmers growing orchards from seed, and as it appears in your report it places me in a false position which I desire to correct. My remarks must have been so disconnected that the reporter could not make out what I said, or else I did not say what I intended to.

The idea, there carried, that all apple trees from seed will bear sooner and better crops of apples than when root grafted, I do not believe. That a tree hardy enough to stand the transfer and bear fruit will fruit sooner from the root graft than the original tree did from seed cannot be denied.

That many seedling trees will be long-lived and bear good crops of apples while on their own roots, that cannot be made a success when grown as root grafts is also true.

While we have such varieties as the Duchess, Lieby and other Russians, and a few seedlings that are hardy, on which we must rely for the present, yet we are looking for something equally as hardy in trees but better in some other respects. This, I believe, will soonest come from home-grown seedlings from home-grown seed, and that there should be more seed planting done. And, perhaps, the quickest way to accomplish this desired result in Minnesota and northern Iowa would be for farmers to plant seed largely, and when one or two years old transplant them thick in orchard rows, trees about four feet apart in the row (for he must expect to lose the greater part of them), and cultivate well a few years, and from the survival of the fittest he would get trees that would soon come

into bearing and furnish him with apples well into the winter. But although most of these trees would prove worthless when grown on other roots than their own, yet he would get an orchard that will repay him for his trouble, and, perhaps, furnish one of the trees for the list we are looking for, for the future, which may or may not be one in a thousand planted. But, if seedlings were thus largely grown what might we not expect in valuable new seedlings.

These conclusions are arrived at from my own experience and success with seedlings and the observation of seedlings around me. But, with the general planter orchards from seeds can never take the place of nursery grown trees as far as the hardy kinds we have will fill the bill, but will pay the man growing them while he is helping to find the kinds sought for. Let us plant more apple seed of our hardiest apples.

VALUABLE RUSSIAN FRUITS.

PROF. J. L. BUDD, AMES, IOWA.

[Read at the meeting of the Northern Iowa Horticultural Society at Humboldt.]

Mr. President: A little thought will show that this is a subject for a large book rather than a brief report such as is admissable in our program.

Out of the mixed and misnamed varieties imported by the Department of Agriculture have come many sorts which are proving valuable in some parts of our great domain.

The importations by the college were made from ten to twelve years later, when Dr. Regel, Dr. Shroeder, Dr. Arnold and other Russian pomologists had done much valuable work in correcting the nomenclature of Russian fruits. Our importations were also from varied sections of the great east plain of Europe, including the parts where dent corn, melons and tomatoes ripen as perfectly as in central Iowa. Yet our importations had special cases of mixing of scions, and of blunders in naming; but the nature of these mistakes was such that we were soon able to detect them. As a rule, the blunders we have made in names and numbers were with the scions received from the Department of Agriculture and from amateur growers of varieties from this source.

We commenced the work of propagation with a view to a general testing over great areas by intelligent amateurs, who were willing to aid in the work and report results without prejudice. The twelve years, during which this methodic trial has been going on, have been peculiarly trying ones. We have been able to reach conclusions as to hardiness, exemption from blight, habits of bearing, etc., far more rapidly than possible during a more favorable succession of seasons.

A summarized report, made up from our experimental ledger, would alone do justice to the title selected for this paper. As this cannot be done, we will comment on a few varieties of orchard fruits which have attracted special attention over great areas of the West and North. That the report is only partial, every one who has tested a few of the Russian varieties will be able to testify, as we will leave out the varieties, in whole or in part, with which they have been most favorably impressed. Even the bulletin of the Horticultural Department for 1892, now in press,

will include only the varieties we are propagating at this time, and will leave out many valuable varieties which we have distributed in former years.

APPLES.

WITCHNER'S STRAWBERRY.—Of the varieties of the Yellow Transparent family, we at present place this at the head. In size and season it is about the same as the Yellow Transparent, but the fruit is handsomely blushed on the sunny side, is better in quality and does not appear to be as perishable as the latter sort. The tree is hardier, has better foliage and we have never yet known it to blight. In habits of bearing and evenness and smoothness of fruit, it is fully equal to Yellow Transparent.

BLUSHED CALVILLE (22 M).—This is proving fully as hardy as Duchess at the north. The fruit in size and quality is about like Yellow Transparent, is handsomely blushed and is not as perishable as most summer fruits. Season about ten days later than Yellow Transparent.

EARLY SWEET.—This variety has attracted much attention over a large part of the West. Fruit large, even in size, fine-grained, juicy and very sweet. Season, a week later than the above.

ANISETTE (No. 185).—This is hardier in tree than the Duchess, fully equal to it in bearing, and the fruit is very much better in quality. So far as we know, it is the most valuable variety of the Duchess family. In appearance it is almost identical with the Duchess, but its flesh is fine-grained, juicy, mildly subacid, and, when fully mature, really excellent for dessert use.

LUBSK QUEEN (No. 444).—In tree fully as hardy as Duchess, and noted for heavy and continuous bearing. Fruit large, smooth and covered with varied shades of red, pink and crimson. Flesh fine-grained, subacid and very good in quality for any use. In the near future this variety will be a popular market variety on account of its rare beauty. Last fall I saw crates of it sold on South Water Street, Chicago, at fancy prices.

GIPSY GIRL (56 VOR).—Our No. 56 from Veronesh is the true Gipsy Girl. No. 1227 from Dr. Regel is named Gipsy Girl, and is a very valuable variety, as it is an immense bearer of handsome oblate apples of excellent quality, which keep well into early winter. In Canada, Prof. John Craig reports it to be a valuable winter apple. Its name is not yet known.

The true Gipsy Girl is a fine tree in nursery and orchard. Fruit large, oblong, smooth and remarkably handsome. A famous train boy and market woman's variety over east Europe. The fruit is not perishable and is of excellent quality for all uses. A heavy and continuous bearer. Season, October and November.

LARGE ANIS (No. 413, DEPARTMENT).—This was imported by the Department of Agriculture under the name of Cross apple. It is an iron clad tree noted for its heavy and continued bearing. Fruit of medium size, uniform shape, handsome coloring and good quality. Season, late fall and early winter in the north district.

RECUMBENT (No. 378).—Tree hardier than Duchess, and fully equal to it in bearing. Taking all things into consideration, perhaps, this is the best variety of the Hibernal family; yet many prefer No. 327 of the Department list, claiming it to be better in quality for culinary and even

dessert use. But we do not find very much difference in the size, quality or bearing habits of the five varieties of this family we have fruited and distributed. This will be the great market variety for culinary use during the months of November, December and January at the North. For culinary use no variety known is superior to the varieties of this family.

KURSK REINETTE (20 M).—Of the Longfield family with the same habit of early and continuous bearing. Fruit more oblong than Longfield and of about the same color. Flesh fine-grained, tender and sweet. As a baking and boiling apple and for dessert use, this will be prized over a large part of our country. Season, November.

APORT ORIENT.—This is selected as one of the best of the numerous varieties of the Alexander family. But, of this we are not yet certain, as our attention is continually called to hardy, blight-proof members of this numerous family, which bear fine crops of remarkably handsome and salable fruit. The fruit of Aport Orient is very large, gorgeously colored, and of excellent quality for an apple of its size. Season, late fall in north Iowa.

BERGAMOT (No. 424).—This is a member of the Antonovka family. As with the Hibernal family, we have a number of valuable varieties nearly identical with Antonovka, some of which are about as free from blight as Duchess. Nos. 105, 224, 324 and Vilne Antonovka are of this family. Perhaps the latter one will prove the latest keeper and the most valuable of the list. But No. 424 has been longer known, and is very valuable. At its north limit of growth, it keeps well into the winter.

POINTED PIPPIN (No. 361).—A true iron-clad and perfect tree on varied soils. Fruit large, conical, coming to a point at the narrow basin. Skin yellow, covered with stripes and splashes of crimson with much bloom. Flesh fine-grained, sub-acid and very good. Season, early winter in north district.

LONGFIELD.—This is well known, and I only wish to advise its top-working on Hibernal stocks in the north district. When root-grafted it is such an immoderate bearer that the fruit runs small and soon exhausts the vitality of the tree. On Hibernal the fruit averages much larger, keeps later and is in every way more valuable. The tree also will prove more durable. Our present opinion is that No. 387 of our importation from St. Petersburg is not the true Good Peasant, as it was named, but it is a better tree than Longfield; the fruit averages larger and will keep longer.

ZUZOFF (No. 585).—This variety has been supposed to rank with the Wealthy in hardiness; but root-grafted trees are doing well, and bearing heavy crops on dry soil in north Iowa. Yet we advise top-working it on some members of the Hibernal family. It is one of the most certain annual bearers of the whole Russian list, for the reason that it blossoms fully as late in the spring as Rawle's Janet. When all other Russian varieties are in full leaf, this variety has its winter expression. Fruit very large, remarkably handsome in coloring and with much bloom. Flesh fine-grained, juicy, sub-acid, and about as good as Northern Spy in quality. Season in the north district, mid-winter, and with early picking and systematic storing it may be kept till June. Special attention is directed to this variety, as it will have very great value for northern growing for home use and market. The Department No. 585 is not true to name, as sent out by Mr. Tuttle and others.

MALLET (No. 980).—This was imported by the Department under a false name. It is the true Mallett apple of the Volga. It is fully as hardy as Duchess, as regular in bearing, as free from blight and promises to be very valuable. Fruit in size, color and quality much like Wealthy, but it keeps fully a month longer. We have eaten the fruit grown in Minnesota in fine condition in March.

KEIV REINETTE (No. 447).—Hardier than Duchess. Fruit large, smooth, yellow, with crimson splashes and a rich bloom. Valuable for all uses. Season, late fall and early winter.

MARMALADE (88 VOR).—A perfect tree on varied soils. Fruit large, yellow, blushed on sunny side. It is specially valuable for jellies, marmalades and other culinary uses requiring much grape sugar. Season, midwinter.

OSTREKOFF (4M).—Tree hardier than Duchess and less subject to blight. An early, heavy and continuous bearer, and will need manure to keep up the size of fruit after it has borne heavy crops. Fruit medium to large, even in size, yellow. Flesh firm, sub-acid, and excellent in quality. Will keep until spring on its north limit of growth.

LEDENETS (30 M).—An iron-clad tree succeeding best on dry soils without shelter at the north and west. A heavy and continuous bearer. Fruit large, oblate, yellow, with blush on sunny side. Flesh fine-grained, sub-acid, very good, Season very late on its north limit of growth.

LEAD (3 M).—This also does best on dry soil without shelter. Fruit large, oblate, conical, yellow, with stripes and splashes of red on sunny side. It is most valuable for culinary use, but when fully ripe it is better for dessert use than Willow or Ben Davis. Season, late winter in north Iowa.

ROYAL TABLE (5 M).—This also needs dry soil and open exposure. An early and continuous bearer. Fruit medium to large, conic, ribbed with red on sunny side. Flesh white, fine-grained, sub-acid, nearly best in quality. Season, mid-winter.

APORT (No. 252).—Hardier in tree than Wealthy, but not quite as hardy as Duchess. An early and continuous bearer. Fruit medium to large, oblate, yellow, with splashes and stripes of red and crimson. Flesh fine-grained, sub-acid, nearly best in quality. Season, mid-winter.

GOOD PEASANT (32 M).—Of the Longfield family and equal to it in bearing. Fruit larger than Longfield, with much more color, and a month later in season. In south Iowa it has been reported as large as Jonathan, as late in season and as good in quality. This promises to be very valuable in all parts of the state.

VERONESH ROSY (No. 1277).—Tree hardier than Wealthy, and it may prove more valuable when top-worked in north Iowa. Fruit medium to large, beautifully colored and high in quality. In south Iowa it has been reported equal to Rome Beauty in size, appearance, season and quality. Specially valuable.

SKLANKA BOG.—This is an iron-clad tree on dry soils. Fruit medium in size, conical, yellow, with blush on sunny side. Quality better than Baldwin. Season, mid-winter, and very late on its north limit of growth.

SWINSOVKA VOR.—This is the Lead apple of the corn growing region of south central Russia, and is not identical with 3 M, or the Lead apple of the Department list. Fruit medium to large, green, with yellow on

sunny side. Flesh fine-grained, firm, sub-acid, juicy, and excellent for dessert use. Season, mid-winter.

REGEL (No. 169).—This was imported by the College under the name of Green Sweet. It is proving a very hardy tree, and, supposing it to be a sweet apple, it has been widely scattered. It proves to be a variety of the Repka Malenka family, and a good keeper in the north district. Fruit much like Rawle's Janet in size, color, flesh and quality.

ANISIM (18 M).—A very hardy tree doing well on varied soils. Fruit in size, color and season much like Jonathan, and nearly equal to the latter in quality.

CROSS (15 M and our No. 413).—This is the true Cross apple of central Russia. On dry soils without shelter, it is a heavy and continuous bearer and peculiarly valuable. Fruit medium to large, oblate, ribbed, yellow, with red and crimson stripes. Flesh firm, sub-acid, very good in quality for dessert use. Season, late winter in north district.

BOGDANOFF WHITE.—Of the same family as 24 M. Fruit large, yellowish-white, fine-grained, and excellent in quality. Season, mid-winter in northern district.

VOLGA CROSS.—This is the Cross apple found on the Volga, near the home of the Duchess. The tree appears to be an iron-clad, and free from blight. An early and continuous bearer. Fruit medium to large, oblate, sub-acid, and much better than Willow in quality. Season, very late winter.

BOGDANOFF.—On dry soils in unsheltered positions, this will prove very valuable in north Iowa. Where fruited in this country, it has been called "a glorified Dominie." In shape, size and color it is much like the latter, but has more color and bloom. Flesh fine-grained, tender, sub-acid and nearly best in quality. Season, late winter.

SWEET CROSS (8 M).—This is a variety of the Cross apple family, with fruit in size, color and season almost identical with 15 M. Flesh fine-grained, tender and very sweet. This can be grown anywhere in the North on dry soil and in open exposure, as is the case with other valuable varieties specially noted in this list. The varieties specially referred to as requiring dry soil and open exposure are as much subject to blight as Yellow Transparent. Such varieties cannot be dispensed with, but they must not be planted in close-sheltered positions.

The subject assigned would also include notes on pears, plums, prunes, cherries and other fruits imported from east Europe and Russia in Asia, but this would far exceed the limits and time that can be allotted to any one paper. This will be given in bulletin form to those who make application for it.

PLANT DEEP AND SHADE THE GROUND.

S. D. RICHARDSON, WINNEBAGO CITY.

Several points which seem to be of the utmost importance to raisers of apples in Minnesota were stated in the last meeting of our society, to which I would call attention. Mr. Derby, who lives on the prairie in the vicinity of Rochester, Minn., became impressed with the idea of putting the roots of the apple tree down into the clay subsoil, and put his idea into practice by setting a small orchard two and one-half feet deep, and we have the testimony of Mr. Somerville and Mr. Keel that the trees are sound, healthy and vigorous, and bear uncommonly large fruit.

Pleased with his success, some years later he enlarged his orchard and set six more rows of apple trees. His hired men set three rows, but did not set them deep enough to suit him, so he set the three remaining rows himself. The trees set by Mr. Derby are sound and healthy, while those set by the hired men are either dead or dying. In the spring of 1884, Mr. .....of.....Dakota, set an orchard, digging large holes two and one-half feet in depth, giving the roots of the trees plenty of room and using the top soil to fill the holes. The result has been that the trees have survived drouth that killed our native forest trees, and are, perhaps, the only apple trees left in the county.

What is there in the nature of the apple tree to lead us to expect the same results, if we follow the same methods? First, the roots used by all nurserymen for grafting are seedlings, and but very few are hardy. By deep setting the tender root is buried so deep as to escape injury by thawing and freezing, and the top will throw out so many roots of its own that the tree is practically on its own roots. Second, the deep setting brings the limbs down where they ought to be, viz: at or near the surface of the ground, keeping the tree from sun-scald and preventing it being so easily shaken by the wind. Mr. Somerville mulches his orchard every year with strawy manure, some thirty or thirty-five loads to the acre, and lets his hogs do the cultivating with their snouts, and as a result his trees make a good growth every year and bear an annual crop of fruit. He is not troubled with blight. It seems to be a well established fact that heavy mulching, keeping the ground moist and cool, will prevent any serious injury from blight.

Let us recapitulate: Dry ground, so the tree can be set deep, causing new roots to grow from the body, so the tree is practically on its own roots. Low tops; limbs starting out at or near the surface of the ground to avoid sun-scald and keep the tree from being easily shaken by the wind. Protection of the ground from the direct rays of the sun by heavy mulching, giving our apple trees essentially the same conditions enjoyed by our native forest trees. I believe if any one will do this, also read and practice the many useful thoughts scattered through the pages of our horticultural reports, he will not find any serious difficulty in raising plenty of apples—apples equal both in flavor and color, if not superior, to those anywhere else in the United States.

SOME NOTES ON OUR OBSERVATIONS IN 1892.

J. S. HARRIS, LA CRESCENT.

(Special Agent Division of Pomology.)

Mr. President and friends of the Minnesota State Horticultural Society:

Through the influence of yourself and other members of this society, and of our U. S. Senator, Hon. C. K. Davis, and of Congressman, Hon. John Lind, I received an appointment from the U. S. Department of Agriculture as a special field agent of the Division of Pomology for the term of three months, beginning August 1st, 1892.

In discharging the duties of this position, I was enabled to visit the Inter-State Fair at La Crosse, Wis.; the Wisconsin State Fair at Milwaukee, Wis.; the Minnesota State Fair at Hamline, and the Houston and

Freeborn County Fairs; also the State Experiment Station at St. Anthony Park and the substation at Owatonna, and besides to visit and inspect orchards in twelve counties of this state.

RUSSIAN APPLES.—I am becoming strongly of the opinion that some of the varieties of apples recently introduced into this country from Russia are destined to become important factors in the future pomology of Minnesota and the Northwest generally, for the reason that they are in certain respects extremely hardy, have large and thick foliage that is able to resist heat, drouth, rust and fungus diseases, and are not sensitive to sudden changes of the weather. The trees ripen up their season's growth naturally, and when they have gone into rest for the winter are not excited into a new flow of sap by changes of weather from dry to wet, and cold to heat, as are some of our American varieties. At the blooming period last spring, the prospect seemed favorable for the largest crop of fruit ever known in this region, and especially so of apples. Never before had all varieties been known to bloom so profusely. About that period considerable rain fell, and for a considerable time afterward we had but little sunshine, and the atmosphere was what we generally term close and overcharged with moisture, and some pretty warm days occured.

Between the first and tenth of June we discovered that something was wrong with the apple trees. First, a grayish mildew appeared on the stalks and undersides of the leaves, and on the stems of the newly forming fruit, soon turning them yellow and brown; and soon after a considerable portion of the foliage and fruit had dropped to the ground, leaving the trees with a sorry appearance. On looking about we found that all varieties did not suffer alike, and that a considerable number of the Russian varieties were not perceptibly affected, and, generally, where old enough to bear, matured a good crop of very fine fruit; and in localities where some of the older American varieties were a total failure, or the little fruit produced was more or less scabby, and inferior in size or quality.

The trouble extended over the entire state of Wisconsin, southeastern Minnesota, northeastern Iowa, and, I presume, over other sections of the country. It appeared to be the worst in eastern and southern Wisconsin and on the valley lands along the Mississppi river and its tributaries, and growing gradually less as we advanced westward upon the high prairie and table lands. The fruit shown at the Wisconsin State Fair was very largely produced upon the high lands about Baraboo and in Vernon county; fully one-half of the varieties shown were Russians, and without them the exhibition would have been very ordinary in appearance. In our own state the difference was not so marked, but a great number of the finest apples were Russians and their seedlings.

The American varieties were affected in about the following order, viz: Haas, Walbridge, Talman Sweet, Fameuse, Golden Russett, Plumb Cider, Ben Davis, Willow Twig, St. Lawrence, Bailey Sweet, Utter, Malinda, Price's Sweet. The McMahon White, Wealthy and Wolf River were nearly exempt, except in very low and protected places. The Russian varieties and some that have originated from seed of them, as the Peerless, Patten's Greening, five varieties of Rugby seedlings and several others, were nearly or entirely exempt from the malady, and matured satisfactory crops of fine, perfect fruit.

THE SIBERIAN SPECIES.—Many of them suffered in the same manner, and the crop of crabs was nearly a total failure.

ORCHARDS.—We were led to the conclusion that the best sites for orchards are on the highest and dryest land available; that some protection is beneficial; that it should be most dense on the south and at some considerable distance away on the west and north; that the shelter on the north and west should not be so dense as to stop the wind or circulation of air, but rather break it up. We have seen some very fair orchards where quite closely sheltered, but think the trees in such are more subject to blight, sun-scald and frost. In many orchards the largest and best trees are found in the two rows nearest the south windbreak, provided they are far enough distant to prevent being drawn by shade or receive injury from the roots of the windbreak robbing the soil of moisture and fertility. The trees on the west side, also, when not less than 60 to 100 feet from the windbreak, are not usually seriously injured by the shelter, and we think are better than where fully exposed. The rows nearest to a north windbreak, especially where the land declines into a ravine or valley, are usually the poorest and the most are lost in them; but it will require further investigation to satisfy us that the presence of the windbreak is the prime cause of it. On level ground or ground facing to the south, such a shelter would tend to confine heat and stimulate the trees to start earlier in the spring, and cause frozen-sap blight; and the heated air when charged with excessive moisture might force rapid and immature growth, predisposed to blight.

The best fruit of last season was invariably found on high clay or sandy loam or limestone soils, sufficiently undulating to give good air and soil drainage; and where either cultivation was given or the ground was kept mulched sufficiently about the trees to prevent the excessive evaporation of moisture and keep the grass down; or where the whole surface of the ground received an annual dressing of manure. An orchard will not thrive long when sodded down to timothy and blue grass. I have not yet discovered an orchard where horses or cattle are allowed to pasture in it at any season of the year, that is proving satisfactory, and the owners of such orchards generally give up in disgust, join the army of croakers and proclaim to the world that fruit will not grow in Minnesota. The tramping of the ground is injurious to the roots of the trees, and even staking out the cow to keep down the grass, though she do not browse the trees, and the turning in of calves to wean, is sure to prove disastrous in the end. Browsing and horn pruning is the worst of all pruning, and beef and good apples cannot be gathered from the same tree. The only stock that should be allowed to run in the orchard is young swine, and they should be kept out whenever the ground is so wet that it would not do to plow or cultivate.

VARIETIES.-Of all the varieties planted in the early years, the Oldenburg the only one of which any considerable number of the first planting of trees still remain, aside from the Trancendent crab and a few others of the Siberian species. We frequently come across those that have been planted out from twenty-five to thirty years, that are the only survivors of that age, except a few Siberians. Many of these old trees, perhaps all, received some injury in the winter of 1884-85, but have very generally recovered to such an extent as to continue to bear profitable crops of fruit. Mr.

Somerville of Viola has one of them supposed to be 33 or 34 years old, that has borne fruit for 27 years, a plate of the first crop being exhibited at the state fair held in Rochester in 1866. The tree stands perpendicular, and the trunk is about 4½ feet to lowest branches; has never shown sun-scald, and looks to be in excellent condition. In some seasons as high as 20 bushels of fruit have been picked from it, nor has it ever appeared to be injuriously affected from the protection of dense windbreaks, with which the orchards of Mr. Somerville are very closely surrounded.

The impression has gone out that Steele county, and especially that portion of it adjacent to Owatonna, is not well adapted to orcharding. G. W. Buffum, who resides some two miles west of the city, has an orchard chiefly of Oldenburg and Transcendent crab trees, that has been planted 27 years and, thus, has passed through the severest tests known to this climate. The trees are generally looking well, and last fall the Oldenburg were carrying all the fruit they could stand under and looking much more vigorous and healthy than the Transcendants, which were bearing nothing. The orchard is planted upon elevated ground and has shelter belts of deciduous trees on the south and west sides. He reports that he has lost but few trees of these varieties, while the American varieties, including the Wealthy, have suffered severely. At D. K. Michenor's in Fillmore county are a considerable number of the Oldenburg trees set out about the same time, that have survived through all trying ordeals incident to this climate, except cattle browsing and horn pruning, and have proved a profitable investment. They are still vigorous and productive, and have prompted Mr. M. to plant freely of that and a few other varieties, until he now has some ten acres of bearing orchard, fully one-half of this one variety, that brings him an income each alternate year of from one to two thousand dollars; and his success has encouraged others to plant orchards, so that Fillmore county is gaining an enviable notoriety for her apple products. In Houston, Winona, Rice, Wabasha and other counties are found other like instances, which serve to prove that the Oldenburg is hardy enough to be reasonably safe to plant, and as some of its seedlings are apparently equally hardy and produce fruit of better quality, the inference is that we should look to the Russians and their seedling descendents for our future supply of apples. There are other varieties of Russians equally hardy, that if freely planted will prolong the season of apples until winter or spring.

It is very generally believed that apple trees, as a rule, will not be long-lived in this country. If that shonld prove to be the case, it will not prove any serious disadvantage, providing varieties are planted that commence bearing at an early age and bear liberal crops, for the reason that the trees may be planted more closely together, and also that the fruit of young orchards is of much better quality. More barrels of apples can be gathered from an orchard of Wealthys, Hibernals, Longfields and Good Peasants in the first ten years after planting than from Fameuse, St. Lawrence, Northern Spy and some others in the first twenty years. Some of our most successful orchardists practice keeping up the orchard by setting a few trees every spring. Some of the best and most fruitful orchards we found in our explorations have been managed on this plan. E. H. S. Dartt of Owatonna has a two and one-half acre orchard set with four-year-old Oldenburg trees in the spring 1885, that had been dug and

buried the fall previous, from which he last fall gathered one hundred and five barrels of first-class fruit, netting him more than $100 per acre. C. Morgan of Fillmore county had over a thousand trees of about the same age, bearing from a half to three bushels per tree, and R. C. Keel of Rochester realized the best results from young orchards of Wealthy and Longfield. Had the farmers of Minnesota re-planted their dead orchards at once after they were killed out, even with the best of the old varieties, the last year's crop would have proved a bonanza.

BOXING TREES.—A TALK.

O. F. BRAND, FARIBAULT.

One of the gentlemen has asked me to tell the society what little I know about boxing trees. The protection I have given to trees has demonstrated to me that the plan is a success. I boxed quite a number of trees a year ago last fall, as well as the previous fall, and had good luck with all of them. I think it is an advantage even during a mild winter, although a protection of two or three thicknesses of manilla paper might have been just as efficient during the last three or four winters. But during those winters which occasionally come upon us without much warning, those severe winters such as we had in '72 and '73, '79 and '84, we appreciate the great gain, which is to be had by using this protection. Those are the winters in which trees need protection in order to prevent the wood from being killed.

I think I might say a word in regard to setting trees too close together, as this also has much to do with their hardiness, in my opinion. Trees that stand twenty-five or thirty feet apart have plenty of room to gather material from which to build up a crop of apples. Apples cannot be entirely formed from the atmosphere, but, as you know, something must be taken from the soil. The roots must have room to spread out and gather this material. I have always noticed that the trees that bore the most fruit were those which stand long distances apart. I think the two trees in this state that have produced more fruit than any other two trees, stand at least fifty feet apart from the surrounding trees. One of them, I think, stood at least one hundred feet from any other tree. To return to the subject of boxing, I have boxed up a good many trees this last fall with earth, and have also used a good deal of paper in protecting trees. I shall continue this plan, although I have thought some people injured their trees last winter by boxing. I do not know exactly why, as there was no injury to mine. I boxed with clean earth. Of course, I can understand how trees might be injured during such a winter as last winter, when there were frequent showers of rain to soak the earth. If there were ashes in the soil or, perhaps, some other kind of fertilizing material, it might injure the bark of the tree, if the earth was saturated with water. I always take away the boxes in the spring, as there is no neceesity for protection after the frost is out of the ground.

DISCUSSION.

President Underwood: Is there any objection to the practice that some people have of putting the boxes on, filling them

up with earth, and never taking them away until they fall away themselves?

Mr. Brand: I should say there was.

Mr. Smith: This protection is to the body of the tree only?

Mr. Brand: Yes, to the trunk.

Mr. Murray: I would like to hear from Mr. Somerville on the subject.

Mr. Somerville: It would be a rather tedious job with as many trees as I have, to box them in that way. But this gentleman's idea is right in line with the true principles of raising apples in Minnesota. Try and get the head as low as you can get it and start the limbs low. I have a method of boxing trees, that I think a good deal of, which simply consists in taking about seven common plasterer's laths, sawing them the height you want them, and then take some fine light wire and weave it arouud those laths back and forth until you have a web made of it, and then simply tie that around the tree. That makes all the box I want, and gives a free circulation of air, and keeps the rabbits and mice away from the bark, and keeps the whiffletree of the wagon from taking the bark off the tree when you are cultivating it. You can leave this around your tree for a number of years, as it will stay there as long as that wire will hold it on. It is a pretty tedious job, however, to go over fifteen hundred trees in that shape, and I would rather have trees that would stand without boxing.

Mr. Connor. I believe if we grow trees with low heads, that we won't need to box them. We shall derive a great deal of benefit from following this system of growing our trees with low heads. We have found it very successful in northern Iowa. Very few varieties will stand the freezing and thawing and hot sun of early spring time without becoming injured, and if we grow our trees low, we will avoid all that trouble.

Col. Stevens: I would like to ask, if boxing trees does not protect them from the heat of the sun in the early spring, when the trees are apt to suffer from a disease which I should call sun-scald. I have always found it very desirable to protect the trunks of trees, not only from the sun but from the cold. Hence, it is desirable that the branches should come down as near to the surface of the ground as possible, for the purpose of protecting the trunks of the trees. In that event, I do not know that it would be necessary to box them, but, otherwise, I think they should be protected

Mr. Brackett: May I ask if anybody who has had experience in boxing apple trees would consider that the same rule should apply to plum trees?

Mr. Heideman: I do not consider it necessary. If you go to work and box them up and fill with soil, it is the same as if you plant them down lower in the ground. I should think that the protection of lath, which keeps the trunk shaded, would be amply sufficient.

President Underwood: This matter was brought up last year and also two years ago by Mr. Brand and Mr. Kinney. You will find in the report that it is very highly recommended and very fully described. You know the theory has been introduced of slanting the trees somewhat, so that the rays of the sun would not have so direct an effect on the body of the tree. I think that is a good idea. I think that lath is a help, especially on a young tree. The boxing, no doubt, is good, but I think none of them are perfect.

Prof. Connelly, North Dakota: This question of protection to trees is very interesting to me. We have gone over the same ground a good many times in our state. The protection has been given solely with the object of preventing the rays of the sun from striking the trunk of the tree. I do not know whether the boxing that has been spoken of here means protection from the rays of the sun or from rabbits, or what it is. We have protected from the rays of the sun with wire screening, which makes a good protection also from the rabbits. It is a very lasting thing and very simple to make. It admits the air and forms a partial protection from the sun, excluding mice and rabbits. This boxing is wholly new to me, and I would like to hear it brought out more fully.

President Underwood: Mr. Brand, will you tell Mr. Connelly something about this boxing, as you have had a good deal of experience in it.

Mr. Brand: My idea for boxing trees was gathered from the fact that there were several trees in our county banked with earth when they were young trees, and then hay ropes made and the tops wound with them, not so much with the idea of protecting them from the cold as from the rabbits. That practice was continued for five years, and since that time—it is twenty-seven or twenty-eight years now—those trees have only had ordinary care. They have had no protection, whatever, but they have proved to be the best trees in our part of the state, the most productive trees. There has never been a year

in my recollection when the owners of those trees did not have apples to sell. This year they sold from six trees, the storm having broken down the seventh, 85 bushels, which would be an average of a little more than 14 bushels to a tree. Now I figure it out that the protection given to those trees when they were young prevented them from being injured, and enabled them to get a good start in life, to form better roots and more of them. After they had reached a certain age, there was no liability of their being injured. I think they are better trees to-day for having had that protection while young.

Now, I think there is no person here who will dispute the fact that there is no tree in Minnesota but what may be benefitted by having good care taken of it in its youth. It can be made to live longer and grow larger and be a better tree when it is a hundred or two hundred years old for having had good care for the first four or five years of its life. Now, in boxing the trees with earth, I think there will be a difference in the degree of cold it is called upon to sustain, but I do not think that amounts to so much as the manner in which the frost is taken out of the tree, or as the prevention of the reserve food supply, that is stored up in the trunk of the tree by the leaves, being taken out of the tree by our extreme cold dry winds. I think the trees suffer more from a loss of food material by reason of these dry winds, than they do in almost any other way. That food supply having been exhausted by the extreme cold of December, January and February, there is but very little life left in the tree when March comes, and that is the time when the injury begins to be made manifest by sun-scald on the south side of the tree. Now, this boxing will aid in retaining that food in the tree.

Mr. Harris: I cannot see any reason why the tree should be injured by putting earth around it late enough in the fall and taking it away early enough in the spring, unless that earth inside of the box got too wet. One year I lost a number of trees by banking them up to keep the mice away from them. Heavy rains came on and saturated that dirt pretty thoroughly, and then there came a very sudden freeze and thaw in the spring; and when I came to take that banking away the bark went with it. I can conceive that the rain running down the forks of the tree into a box might saturate the earth in such away as to injure the bark of the tree. The most critical time with our young apple trees is the first winter after they are set out. If you can carry them through the first winter by this

process of boxing, or by wrapping with any material, I think it adds to the life of the tree very much. One of the best coverings that I have ever seen or ever tried is cotton cloth. Tear it up into strips and, beginning down on the ground, wind it up to the branches. You can do this considerably earlier than you can put on the boxes, and it can be removed in the spring. The heat of the sun does not go through the white cloth and start the flow of sap prematurely.

President Underwood: I should think this matter of protection would be a good one for the experimental station to take up. I should think they might plant some trees and protect them in different ways, and see which way is the best.

Dr. Frisselle: Last year and the year before, our friend, Mr. Keel, spoke of wrapping trees with gunnysacking, as being an economical and easily applied protection, and said that it was even better than boxing.

Mr. Keel: I have had some experience in protecting trees with gunnysacking, but it has been done mostly to protect them from the rabbits. Down in our part of the country it does not seem necessary to us to protect the trees with boxes or anything else, except from the rabbits.

Col. Stevens: I would like to ask Mr. Keel, if his predecessor, Mr. Jordan, did not recommend mulching trees in the fall of the year? That is, putting something around them to protect them from the freezing and thawing in the spring. He said if you did not protect the trees they would not only rootkill during the winter, but the bark of the tree next to the surface of the ground was bound to be injured. He claimed that by protecting them in that way, he was able to star this orchard. That was twenty-five years ago, perhaps.

Mr. Richardson: I was in an orchard a few weeks ago where a gentleman had bound the trees with straw, and his trees were apparently doing first-rate. He used it as a protection against the rabbits and left it on all summer, with apparently no bad results.

Mr. Terry, Slayton: I have been engaged in tree planting ever since 1873, and I have found the following plan very successful. In the first place, I go out with a lot of newspapers and wrap them around my trees, and after doing that I throw up about six inches of earth around each tree. I have succeeded in preserving my trees, without an exception. The paper, of course, is to protect them from rabbits, but the earth thrown up around the trees is to prevent the tree from being

injured in those warm days when the moisture runs down the trunk, especially towards spring. I claim the life of the tree is in the ring, and if it freezes on the ring it will split the bark. If the bark of the tree is split at the ring, it will die. I believe that winding gunnysacking or straw around a tree, or anything of that sort, is too much work, because the paper can be put on so much easier.

Prof. Williams, South Dakota: I should think there would be this objection to wrapping the tree with straw or anything else—it would be a regular harboring place for insects, especially those that winter over. In a great many instances we would find that we had jumped out of the frying pan into the fire. I would like to ask Mr. Wedge if his trees were injured at all by the late frosts this spring.

Mr. Wedge: No, there was no injury that I could discover, to the blossoms or foliage.

Prof. Williams: I asked because in some parts of our state it was found that while the trees showed no indications of injury to begin with, as the season went by they had a good deal of blight and one or two other things that threatened in some cases to destroy the orchards entirely, especially the young orchards. Of course, freezing weakens a tree and makes it more liable to blight. The matter of overbearing, that Mr. Wedge mentioned, is one to be guarded against, because this blight is apt to take advantage of any weakness occasioned by either the climate or anything else. Overbearing weakens a tree, and, therefore, we should guard against it.

Mr. Brand: There is a very important point brought out here, indirectly, and that is this: Suppose you have six hundred apples on a tree, and you go to work and pick off two hundred of them. Now, you will get just as many bushels when that fruit is ripe, as you would if the six hundred were on the tree, and yet you only ripen the four hundred. The ripening of the seed is what takes the vitality out of the tree.

Prof. Williams: I think that point ought to be emphasized, too; that we ought to have good, strong seed to plant, and take them from the best apples.

Mr. Harris: If our nurserymen followed that plan, in a very few generations we should find a difference in the longevity of our trees.

Mr. Wedge: I would like to hear from Mr. Somerville on the question of trees bearing every year.

Mr. Somerville: Well, I can only say that as far as my own orchard is concerned, I have fruit every year. I have no off years. I want to ask a question in order to get some information. We have a man in our neighborhood who is a crank about setting out trees, and I want to know whether his method is right, in your opinion. He, undoubtedly, raises the biggest Duchess apples of any man we have in the whole country. Now, he puts his trees about two feet and sometimes three feet, right down in the ground. Is there anything in it?

Prof. Williams: We did that same thing in our home orchards. We did not plant quite as deep as that, perhaps, but we planted about six inches deeper than anyone else in the neighborhood, and we got the same results that Mr. Somerville has spoken of.

President Underwood: Let me suggest that what we are suffering from to a great extent is the drouth. Now, roots that are deep down in the ground are not so easily affected by the drouth. The ground dries on the surface—and is not that one of the reasons why deep planting is better? If the ground was very wet you would not want to plant deep. Now, the Scotch Pine has no surface roots, but its roots run down into the ground. Some of the evergreens have roots near the surface, and when they die it is because the trees are exhausted from drought on account of the roots being near the surface. Now, I think that is the reason why this gentleman's trees do so well —because his ground seems dry, but the roots being deep get the moisture better.

Prof. Williams: I think in all probability that the matter of drainage of the soil would have a great deal to do in that matter.

Judge Moyer: What kind of soil has he?

Mr. Sommerville: It is our best prairie soil. The ground is dry, and it is very rich ground. He told me that he set trees no less than two and one-half feet deep.

Mr. Harris: Where the soil is pretty loose and the drainage is good, that deep setting is not injurious. I have seen some large apples raised, however, from trees that were not set so deep.

DISCUSSION ON MARKETING APPLES, STATISTICS, ETC.

Mr. J. B. Mitchell, Cresco, Iowa: I would like to say a few words on picking and handling apples. I think it is a subject of great importance. I use a ladder that is pointed at the top,

and you can put it in the tree where you see fit. I then use a basket for picking in, and I have a hook in it that I can hook on the limb, where it is convenient. I pick the fruit carefully and, of course, sort it and put in nothing but what is good. I pack them, as has been recommended here, putting in the first two or three layers with the stems down. Our home market was so flooded with the Duchess we had to sell them at 50 cents a bushel. That was all I could get for my own, even though they were hand-picked. I shipped mine to Minneapolis and got 90 cents net, delivered on the cars at Cresco, while others could get but 50 cents at home. I think the 40 cents a bushel extra paid me well for the difference in the picking and packing.

Mr. Allyn: I did not believe that we could raise fruit in Minnesota at one time, but I am now pretty well converted. The taking care of the fruit seems to be the thing necessary now. The packing and marketing of it is the important question. There is no question but what we can raise an abundance of fruit, and we must exercise a good deal of judgment in our caring for it. We lose a great deal of fruit every year by careless packing and careless gathering and careless marketing. It is not satisfactory to the consumer either, for he would rather pay a little more and have something that is nice. I hope this question will be taken home, and that our fruit will be gathered and brought to market in good shape.

Mr. Pearce: There is a good deal in packing the Wealthy apple. There was an old man in Ohio, sixty-five or seventy years old, who said to me, "If I shake my apples off in the old of the moon, they all dry up, and if I shake them off in the new of the moon, they all rot." (Laughter.) My rule is to pick my apples about two o'clock in the afternoon, when everything is bright and dry as possible. I will guarantee that I can take the Wealthy apple and put it up, and take it out the following May as sound as it was in the fall. Those apples bring me any price I ask in the spring. I go to a man and ask him if he wants them, and he says, yes, and never asks the price. The Wealthy apple is the best apple in the Northwest.

Mr. Keel: I handle about as many apples as any man in the state, I believe. I believe it would be well enough to pack the apples as some of the gentlemen have said, in oats or wheat chaff, for one's individual use, but when you come to sell them to the merchants they do not want to buy oats with the apples.

I want to pack apples when I pack apples, and to pack oats when I pack oats. (Laughter.) I pick my apples from seven o'clock in the morning until six o'clock at night.

General C. C. Andrews, St. Paul: I read in this morning's Tribune that in the proceedings of this society Mr. R. C. Keel of Rochester stated he had sold $4,000 worth of Minnesota apples last year. I want to know if that is a fact.

Mr. Keel: I never reported that I sold $4,000 worth. I sold about 3,500 bushels, and they averaged me about a dollar a bushel. Those are the facts.

Mr. Harris; Nearly one-half of the apples grown are of the Duchess of Oldenburg variety. I estimated in the last "Farm, Stock and Home" 200,000 bushels as the crop this year, but I got it below what it was.

General Andrews: What is the value of the apples grown in the state of Minnesota?

Mr. Harris: I believe that the value of the crop of apples grown in Minnesota is at least $200,000. This is an off year for fruit over the country, and in many places in Minnesota it is also an off year.

General Andrews: I hope the reporter will state that, and let it go out to the people. I keep pretty well posted, but I am not as well posted as I ought to be, and I know the general public is not. I know people talk if they could only raise fruit in Minnesota, if they could only raise apples in Minnesota, what a blessed state it would be. Now, if the society would only let this fact of the value of the apple product of Minnesota be known generally throughout the state and country, it would be of great value indeed.

Mr. Sampson: I know of two car loads of empty grape baskets, at least, that were shipped to Excelsior to be filled with grapes for the market. General Andrews can form some idea of our fruit crop from that. Raspberry and strawberry boxes were also shipped in proportion.

Mr. Wedge: It is my impression that Mr. Harris' figures as to the apple crop are altogether too low.

Mr. Somerville: I am of Mr. Wedge's opinion that Mr. Harris has put the estimate entirely too low, from observations that I have made in the state.

Mr. Pearce: That is my opinion also.

Mr. Harris: Well, I wanted to be on the safe side, although I believe, myself, that the value of our apple crop was nearly twice what I have stated. Now, I want to go back and say a

few words on the question of picking and selling apples. I will tell you how they do it down in Houston county. The farmers down there raise wheat, hogs and apples, and they make more money out of their apples than they do on their wheat and hogs. Well, when they are carting apples, they put the side bars on the wagons and fill the box up full, and they put bags on top of that, and then the whole family piles on top, and away they go to market. The result is that you can get plenty of Duchess apples in La Crosse at 25 cents a bushel, while purchasers would prefer to go out to the orchards and pay 85 cents a bushel. There are hundreds and thousands of bushels of apples marketed that way that are of little value, while, if they had been picked and packed carefully by hand and sent by express to Minneapolis, they would have brought a dollar a bushel.

There is nothing that pays like careful picking and putting into neat packages, getting them into market so they look exactly as well as when picked, or a little better. If you have time, like Mr. Pearce, to take your pocket handkerchief and polish them (laughter), you will find that everybody will want them; but if you get them into market, and here and there among them there is a small or knotty one, the package will sell for the quality of the poorest one in the package. You want to bear that in mind in handling every kind of fruit. I would rather throw out one-third of my strawberries and let the chickens eat them up than to market them, for I will get more money for the balance than I would to market them promiscuously. I always get more money for my berries than most of the fruit growers in our section, on this account.

Mr. Wyman Elliot: This question of statistics in regard to fruit growing in Minnesota is one of vital importance to us. If we had some statistics upon which we could rely at the present time and during the coming year, we could make very good use of them, but under the present methods of gathering statistics in the state, they are almost valueless. Speaking of the crop of apples that was grown this year, I think, with some of the gentlemen, that the estimate made here by Mr. Harris is far to low. I think we have one county alone that has produeed over 40,000 bushels, Fillmore county. I think that if the statistics had been properly gathered all over the state, that we would have nearer a quarter of a million bushels, than 200,000.

Secretary Latham: I fully coincide with Mr. Elliot's views in this matter, from observations that I have made upon this subject.

Mr. Elliot: I have given considerable attention in former years to this matter of statistics in regard to fruit growing in the state of Minnesota. This year I tried to post myself as well as I could. I have made it a practice in years gone by to go into the market and inquire of our commission men, who gather up these items. I have been convinced that we ought to pay more attention to this particular point. In speaking of small fruits, perhaps, you do not know the amount of berry boxes that are manufactured right here in our own city and distributed here. We have one concern that handle over a million boxes a year. Our grape industry is also increasing very rapidly. Grapes are being planted not only by the hundred and thousand, but by the ten acres. It is not going to be long before Minnesota will take front rank as one of the fruit growing states of the United States. (Applause.)

Mr. Chandler: I have distributed baskets for between five and six hundred tons of grapes from this market this year. Mr. Elliot's statements in regard to berry boxes are about right. There were nearly a million boxes used here last year.

Dr. Frisselle: There is another point I want to bring out in this discussion, and that is, that the man who makes the honest package is ahead in the end. If he gets up a reputation for selling good fruit alone, and for having just as good fruit in the bottom of his basket or barrel as he does on top, I think it pays him in the end.

Mr. Harris: He never has to take the lowest prices.

Mr. Harris: I saw some trees in the orchard of a friend of mine that were topworked on a certain crab stock that he calls the Tonka, and I saw the Anasim that we were talking about. I refer to Mr. Pearce, and I know we would all like to hear from him.

Mr. Pearce: I did'nt come here prepared to say anything. I have been in Minnesota since 1854. I have been a nurseryman and fruit grower all my life, and when I came to Minnesota I found the hardest nut I ever had to crack in all my life. In 1873, I heard men say that apples would never be raised in Minnesota, but I had resolution and never turned back. Now, gentlemen, I have been picking up hardy trees since '73 and '74. I have been working all over the state with that object in view.

After numerous other experiments, I turned my attention to hybridizing. I crossed the Cherry crab with the Duchess of Oldenburg, and I had remarkable success. Now, it is my candid opinion that I have produced an apple from the cross between the Cherry crab and the Duchess,

that will stand against anything anywhere in the United States. I am confident that the Wealthy apple was produced in that way. I have pursued this matter until I have produced an apple as large as the Wealthy, from the cherry Crab fertilized by the Duchess. I also produced the Tonka, the one of which Mr. Harris spoke. My trees do not winter kill nor blight. They are perfectly hardy and grow the farthest north of any. When you come to quality, they are splendid. You can get any quality you want by fertilizing with a certain apple.

The next thing I found out was that the Wealthy was a hybrid beyond all question, and I went to work to fetch it back to where it was when it started. You know our state adopted it for universal planting because it was pronounced perfectly hardy in 1874, and did not kill a bit. Well, by and by, our friend Harris could not rest day or night until he had it retired, and it was recommended to be planted in favorable localities. That made me all the more energetic, and I went to work and topworked it on the Tonka. The Tonka being a hybrid, and that being a hybrid, they united perfectly and grew perfectly. I got double the growth that I ever got from any other root. I got three and a half and four feet the first year, right up. When all the Wealthy trees in the country were blighted, there was not a blight on those trees. Now, I think I checked the blight. I believe those trees are so perfect and so strong that they cannot blight.

Well, I was not satisfied with that, but I went still further. I thought I would topwork it three times, and that seemed to help it again. I have quit selling the Wealthy apple except when it is topworked on the Tonka. I believe I have got the Wealthy back to where it was when it started. In the course of time we will have a test winter that will prove it. Well, I studied the matter all over, and then I struck out in another direction. My next attempt was to grow winter apples, pure winter apples. For a number of years I had been sending to Michigan and other cold countries, and I got seed and planted it. When it was one year old I topworked, that is, I took scions from them and put a dozen on the tree. I expect to develop a genuine winter apple in that way, if I live. I will not condemn your planting Minnesota seedlings, but somehow or other they do not succeed with me as well. If I am going into the hybrid business, I am going to have the first cross or no cross at all. When you get beyond the first cross, you are going to have blighting and root killing and an abnormal growth. They will be short-lived. As long as you cross direct, you may take any variety and grow any variety you want.

There is a subject that I want to bring before you, the necessity of growing trees that will be perfectly hardy in Minnesota. We have some Russian apples here that are A No. 1. You may take the Lieby; wherever that tree does not flourish, there is no use of setting out any other standard apple. It will stand further north than any apple I know of. It is one of the trees we run on. The secret of my success in big growth of apple trees is whole roots. Double-working is the sentiment that I go on. Now, I think double-working has a wonderful effect. For instance, you graft one variety—now I use the Tonka altogether for the Wealthy. If it is possible to produce an apple that will stand anywhere in Minnesota, I think that will stand there. I am very careful to make a close distinction, to know whether I am working with the apple or crab. If it is a

hybrid, I know what root to put it on, and if it is an apple, I also know. Now, I am drawing this exceedingly close. I think if the course I have outlined is pursued right along, we will gradually overcome the blight. I do not believe you can go beyond the first cross, but I know that I can do wonders on the first cross.

Mr. Heideman: Where do you get your hybrid roots on which to graft.?

Mr. Pearce: I grow them.

Mr. Heideman: From what?

Mr. Pearce: Well, I plant Duchess trees away out by themselves, as far from other trees as I can possibly get them, and I graft one-half of the top of that Duchess with the Cherry crab. That is the first cross.

Mr. Wilcox: Allow me to say that in my judgment, it makes a material difference which you use for the parent.

Mr. Pearce: I have always used the Cherry crab, but I do not know that there is much difference.

Mr. Wilcox: One of the laws of nature that is becoming well understood is that the female blossom imparts its characteristics or constitutional vigor and hardiness to the offspring, and if you use the Cherry crab for the female blossom you will certainly secure the constitutional vigor you are seeking.

A TALK ABOUT SEEDLING APPLES.

CHAS. PATTEN, CHARLES CITY, IOWA.

The production of varieties is one of the most important questions we have to consider, in my mind. Now, I wish to call attention at this time to a paper read by Mr. Harris this afternoon with reference to those seedlings that he has discovered all over the state of Minnesota. If you had taken notes as I did, you would have discovered that he found almost entirely summer and fall apples. Scarcely a winter apple was named, except the one red apple that was presented here, the seed of which came from Ohio. Now, I want to suggest to you in your work, and I hope I will not be considered presumptuous in making the suggestion, because it is a subject I have given considerable thought to, that if you take the seeds of the Hibernal or that family of trees as the mother parent, you may expect from the very nature of that tree that you will obtain varieties that are nearly the same as that; that you will have resulting from such a cross, no matter what you cross them with, apples of low quality. You may be sure that any apple of the low grade of the Hibernal family will transmit its leading characteristics of sourness and bitterness and hardness. That is a law of nature, whether among plants or animals.

I wish to say further that so far as my reading goes it is not proved that the mother parent, in all cases, in plants or in animals, will stamp its characteristics upon the leaves or blossoms of progeny. I think if you gentlemen will look over this matter of animals and plants breeding, you will discover that the parent whose character is most prominent will be the one that will stamp itself indelibly upon the offspring. Taking the view of the subject that the gentleman did when he dropped that remark about the female parent, I will say that I began in 1859 to plant the seeds of the Duchess of Oldenburg, and it was from that first planting that I secured this Greening apple that you gentlemen know something about. I believe from looking carefully at the apple and comparing it with the Rhode Island Greening, that it is a cross with that variety. Now, I wish to go back farther. In this work that I have been engaged in, I observed a good many years ago that the apples we had, the American varieties, were running in families. After reading Downing and others, I concluded that the Russet family was, perhaps, the most striking family among all we had.

Twelve years ago this present autumn, I bought a car load of apples from the Wisconsin state university farm. Among those were some very fine Russets, of the Perry and English Russet varieties. I planted the seeds of those. My first thought was that the English Russet was, perhaps, the most important member of that family of Russets. When those seedlings were four years old I transplanted them, and somewhat to my surprise and yet not as much as it would have been had I not studied the subject considerably—I found the Perry Russet, according to the number of plants that I had grown, had produced more hardy seedlings than the Duchess of Oldenberg. Now, that is a statement that you gentlemen will be surprised at. I was somewhat surprised at it myself, but I have long since concluded that the Duchess of Oldenburg is not a Russian apple but a German apple, coming from the province of Oldenburg, and that all the varieties of that apple that were introduced into Poland and Russia were descendants of that Duchess of Oldenburg, and have grown poorer as they have passed to that land where the climate rather forbids a high quality of fruit. I believe most firmly, and I have written a great many pages in which I took this ground, that the greatest mistake of the horticulturists of the Northwest was the fact that they did not, after the winters of 1875 and 1876, plant the seeds of the varieties that had endured our climate during that period. Many of them were Russets. These Russets have fruited.

I take the position that if we have winter apples we must plant the seeds of apples that have the keeping qualities in them; otherwise, we cannot expect to get them. I simply call your attention to this matter, because I believe it is the most important work for the horticulturists of this entire Northwest—the cultivation of hardy fruits. I wish to suggest further, that in the work we take the better class of Russians. Some of them are more hardy than the Duchess, for instance, one of the Anis apples. We have some of the early sweet apples that are still more hardy than the Duchess, and we have many apples that are of good quality for dessert purposes. It is to those apples that we must look, and with which we must work. (Applause.)

PLUMS AND CHERRIES.

REPORT OF COMMITTEE ON PLUMS AND CHERRIES.

C. W. H. HEIDEMAN, NEW ULM.

The plum crop the past year was almost a complete failure; even in the woods and thickets scarcely, a plum was found. In my report on fruit blossoms, I shall attempt to account for the failure. First fruit of several new varieties were secured by hand pollenization and protecting the blossoms, but not in sufficient quantity to pass upon the merits of any. The only plums exhibited at our county fair in September were unknown varieties of prunus domestica, said to be seedlings, from seed brought from Germany.

Cherries, though not as generally planted, gave a good crop. Mr. C. Knospe of New Ulm has about a dozen trees raised from seed brought from Germany; they have fruited regularly for 6 or 7 years and appear to be hardy and healthy; they certainly are productive and of good quality. Mr. H. Knudson of Springfield is successfully growing Early Richmond, Montmorency, English Morello, Ostheim and two or three varieties imported from Denmark. The Danish cherries appear to be hardy and the most profitable. Aug. Meyer of Garden Gate has several varieties of cherries doing well. Clement Schmidt of Mulligan has quite an orchard of seedling cherries and says they have never failed in bearing a crop. The nomenclature of our cherries and plums is sadly mixed and a great deal of confusion exists as to varieties. The writer has run across four different Ostheim cherries and at least a dozen native plums under the names of Egg, Yellow Egg and Peach.

Here is an opportunity for the committee on nomenclature to straighten out the confusion, and prepare for the coming flood of improved native plums.

DISCUSSION.

Mr. Cook: What do you think of the Mariana as a plum stock?

Mr. Underwood: Our success has been very poor with it, although it has been recommended very highly by certain propagators. I do not think that the stocks were first-class. We generally use native stocks, if we can get them. The Mariana is not as hardy as the native stocks.

A Member: Do I understand that if you spray for the curculio that you can depend upon a crop of plums every year?

Mr. Heideman: I have never had any experience in spraying, for the simple reason that I do not think it is necessary. My plum trees are so loaded that I do not need to.

Mr. Murray: That does not agree with my experience at all. Last spring I had to spray in order to save the whole crop. In other years, I lost the whole crop by not spraying.

Mr. Heideman: What was the cause of the general failure of the plum crop last year?

Mr. Murray: Well, the principal reason was that it was so wet that the bees were prevented from fertilizing the flowers.

Mr. Wedge: Since plum stocks have been mentioned, I will say that I remember Mr. Heideman reporting last winter his success in making the sand cherry grow with the native plum; top working it, he said it made a good tree that was very fruitful. This winter at the Iowa meeting I was shown a native plum grown on the sand cherry. The tree was of about ten years growth, I should think, and the union was absolutely perfect.

Mr. Sampson: I would like to ask if there are any cherries that are a practical success in Minnesota?

Mr. Heideman: I mentioned five or six parties in my report who are successfully raising cherries in Brown county. I do not mean they are raising cherries in large quantities, but they are making a success of it in an experimental way.

President Underwood: One of the members has suggested to me that the birds eat a great deal of fruit, and I will say that I heard of a plan a short time ago for the protection of trees from the birds. It consisted of a number of yards of mosquito netting sewed together and put over the tree, so that the birds could not get at the fruit. It is said to be an inexpensive operation.

Mr. Cook: I think it would pay better to raise Russian mulberries to feed the birds on.

Dr. Frisselle: It might be a good thing to protect grape vines with.

Mr. Wedge: I know of a protection that is very much cheaper than that and equally efficient. It is an English bird netting which costs but two cents a yard. It is very durable and will last for many years. I think it might be a practicable thing.

Mr. Terry: I remember very well, when I was a little boy in the old country, that we were only able to get cherries to eat by using that netting. It is a very good plan indeed. Those nets can be kept for years and years. Now, I noticed that most of you horticulturists are great enemies, or at least indifferent lovers, of the Russian mulberry. Some time I think you will change your mind about that. If you have plenty of

mulberry trees around your orchards and grapes and berries, the birds will eat their fruit in preference to any other.

Dr. Frisselle: This question of the birds destroying our fruit is one of considerable importance to us. I have tried a good many things to drive them away. I have tried scarecrows, and they have sat on them and laughed, and then eaten the grapes. The only protection I have been able to give my fruits is by using a shot gun, and with that I have been able to scare them away. I fear that if you follow up this idea of growing mulberries for the birds, that you will attract all the birds in the country to your neighborhood, and when the mulberries are gone they will eat everything else you have. Nobody enjoys the birds better than I do, but when they come to devastate my grape vines and fruit trees, I confess that I am not so enthusiastic about them as I am when they make their first appearance in the spring.

Mrs. Jennie Stager: I think I would prefer to let the robin take a few of my berries and my grapes, and have their society, than to have the few berries and grapes they eat, and do without them. They do a great deal of good, too, in the spring and summer, eating the worms.

An interesting discussion followed upon the best methods of protecting fruit from the raids of the robins and other birds, which lack of space will not allow us to print.

Mr. Cutts: What variety of cherry is best to raise here.

Mrs. Stager: I have a kind that is called the Canada Red, that I have raised for the last four or five years, and it seems to do as well here, if not better, than any other. It is quite hardy. The trees have not been destroyed or blighted in any way, and this is the fifth year they have borne.

Mr. Cutts: Are they eatable?

Mrs. Stager: Yes, they are very palatable.

Mr. Brackett: I would like to inquire if there is any European plum that anybody has tried in this part of the country?

Mr. Somerville: I have four or five varieties of what they call Russian plums, but they are not European plums, of course.

Mr. Cook: I have several varieties of Russian plums and they are apparently very hardy.

Mr. Richardson: One of my neighbors has a cherry tree that is some seventeen or eighteen years old—the Early Richmond. The tree has outlived its usefulness, but he told me that he had had lots of cherries from it and was well pleased with it.

GRAPES.

REPORT OF COMMITTEE ON GRAPES.

E. J. CUTTS, HOWARD LAKE.

Mr. President and members of the State Horticultaral Society:

As one of your committee on grapes I submit the following report: While not as favorable a season as we have sometimes, the grape crop was by no means a failure. The spring was very backward; we did not uncover our vines until about the 20th of May, and the cold, wet weather in June kept them very backward, and the first of July, when in favorable seasons the grapes would be as large as peas, they were yet in blossom; and about the middle of the month I remember remarking that we never had had a failure of the grape crop, but that I would not give much for the chances of a crop this season. But the hot, dry weather in August brought them on very rapidly, and with the absence of frosts in September and the very favorable weather, the crop ripened up nicely and far beyond our expectations. We had a hail storm in June that did considerable damage—I think it knocked off at least one-third of the young shoots; and the unfavorable weather when they were in blossom hindered the development of the young fruit, so that the bunches were not so compact and heavy-shouldered as usual; but the quality was fully up to the standard, so that we had no difficulty in getting forty cents per basket for Concords and fifty cents for Delawares in our own rural villages, where Eastern and Southern fruit was almost a drug at ten cents per basket less.

My observation and experience the past season inclines me to the opinion that we need our vines up higher. I would like the posts six feet out of the ground and the first wire at least thirty inches from the ground, so as to allow freer circulation of air under the vines and to give the sun a chance to strike the ground around the roots. I would go over the vines at least twice in June and break off the surplus shoots, then I would summer prune sparingly, believing that plenty of foliage is necessary for sweet fruit. In 1891 we had six Golden Pocklington vines that mildewed badly, the only mildew that we have had, I believe, in our vicinity. I was afraid it would be much worse last season, but it was not near as bad, and Delaware, Lady and Moore's Early vines near it were not affected at all.

VINE GROWING IN WRIGHT COUNTY.

E. J. CUTTS, HOWARD LAKE.

Although we have not been growing grapes (except a few scattered vines) in Wright county until the past few years, vine growing is no longer an experiment. Where a few years ago, people bought two or three vines and set them out with little hope of success, they are putting out hundreds, and are as sure of a crop as when they plant corn.

And where, until recently, they thought they were doing well if they succeeded in getting a pan-full or two of partially ripe grapes, there are many who are raising all they want for home consumption with a surplus to sell or give away to their less fortunate neighbors.

There was formerly an impression that grape growing was an achievement only attained by a favored few, and that hideous bugbear, winter protection, deterred many from even attempting to grow this most delicious and healthful of all fruits. And even now, visitors to our vineyard will occasionally remark, as they look at the long rows of vine-covered trellises: "Well, that's beautiful, but what a task it must be to cover them all up in the winter." I usually reply, "that if they will come around in November after the vineyard is trimmed, they will see but comparatively little to cover"; and they generally give a look of incredulous surprise, when I tell them that the whole vineyard can be put under ground at an expense of less than one-half cent per pound of the fruit raised.

A few years ago a gentleman from that great grape growing region, Erie county, Pa., visited us, and we had the pleasure of showing him our vines, method of culture, etc., and in conversation with him learned that, although our system of training was a little different from that in his section, yet the labor was about the same. But he would quite frequently remark: "But you have to bury all these vines in the winter." I became a little tired of that and finally inquired what his grapes averaged him per basket last season. He replied: "Seventeen and one-half cents." I then asked, "did it pay;" He replied: "Yes, it paid better than any crop they raised." I had already learned that in addition to fifteen acres of grapes, he carried on a large farm besides. I then told him that I would much rather raise grapes in Minnesota. "Oh!" he said, "but you have to cover them in winter." "Yes," I replied, "but that does not cost over one-half cent per pound, or five cents per basket, and I received fully fifty cents per basket for my entire crop." Now, while they have never been so high since, and, probably, never will be again, yet even at the low price of the past two seasons, I believe that grape growing is profitable.

A large portion of Wright county is specially adapted to grape culture. Our numerous lakes exert a genial influence over the atmosphere, and plenty of timber greatly modifies the cold north winds; and I know from personal observation that there are many other sections of the state equally favored. I think that this coming spring there will be more than double the vines set out in Wright county than in any previous year, and I believe the time is not far distant when no garden will be considered complete without its row or rows of grape vines; and that the valuable information disseminated by this society and the farmers' institutes is doing much towards enlightening the people and encouraging the culture of small fruits, and thus removing the cause for about the only complaint you ever hear made against our beautiful state, and proving the falsity of that old, and, I may add, nearly worn out assertion, "You can't raise fruit in Minnesota."

DISCUSSION.

Professor Green: I would like to ask Mr. Cutts what system he follows in pruning.

Mr. Cutts: It is the one-arm system.

Professor Green: Do you pinch at all?

Mr. Cutts: Yes, sir, I do.

Professor Green: How much?

Mr. Cutts: I do not know that I can answer definitely. We are careful to pinch out all the surplus shoots. I only allow one shoot to grow. By going over the vines at least twice in June and breaking off all the surplus shoots there are, we prevent too much foliage. When they get too long we go over them with the pruning shears and cut off where it is too thick and heavy.

Professor Green: How far back do you pinch them; how many buds do you leave?

Mr. Cutts: I leave about four buds to the vine.

Professor Green: Do your spurs get too long?

Mr. Cutts: Well, when they get too long I remove them entirely.

Professor Green: If you cut them closer than that, you are apt to have trouble, are you not?

Mr. Cutts: Well, by leaving three or four buds it is less work covering them in the fall. You can bend a shoot that is that long easily, whereas, with one or two buds you cannot bend at all without breaking.

Dr. Frisselle: Do you have any trouble with having poor vines?

Mr. Cutts: Well, not very often. Sometimes I do, with some varieties, like the Moore's Early, but not generally.

Dr. Frisselle: What do you do in that case?

Mr. Cutts: I cut the whole thing away.

Dr. Frisselle: Did you ever try planting them nearer together—say five feet instead of eight feet apart?

Mr. Cutts: I have never tried that, no. I am putting out some now, nine feet apart instead of eight. I think it would be a good idea to have them a little closer, but I want plenty of room.

Mr. C. L. Smith: How do you cover them, Mr. Cutts?

Mr. Cutts: We cover them with dirt, of course, but our method of covering is very simple, and quite expeditious. We always mulch under the vines before laying the vine down,

using the cheaper kind of hay. In burying one man starts a trench, and two men lay the vines down, bending the shoots as close to the ground as possible, nearly all of the covering being done by two horses and a plow. I use a 14-inch plow that runs very shallow, having a man follow it with a shovel. I believe I would like to try a special plow, and plow as deep as possible, setting our vines low. By commencing this system of cultivation the vines will get to run pretty deep anyway. Of course, I should be a little afraid to go into an old vineyard and plow it, if it never had been plowed.

Dr. Frisselle: How deep do you aim to cover them?

Mr. Cutts: Three or four inches, so that the wind will not blow it off in the winter.

Dr. Frisselle: How much do you think it costs to put down the vine?

Mr. Cutts: About one-half cent a pound. It won't cost you that—it does not average that. It does not cost any more to trim them here than in Ohio or Pennsylvania. It will not cost you after the trimming one-half cent a pound, and the fruit will surely repay it.

Dr. Frisselle: I think one-half cent a pound would double it.

Mr. Cutts: Yes, I think it would more than do it.

Dr. Frisselle: Do you prefer yearlings or two year-olds?

Mr. Cutts: I prefer two-year-olds, although some yearlings are nearly as good as two-year-olds.

Mr. Brackett: I would like to ask which the members prefer starting, two arms or one. My vineyard, when I started it, had arms running both ways, and the fork above the ground. Consequently, when you put them down, a great many of them would split right in the center. I started a new growth, and still maintained the principle of having two vines, but started them below the surface of the ground, and find they bend easier that way, but still break off. I should think for that reason that one vine would be better. In case I started a new vineyard myself, I would prefer that system.

Mr. Cutts: It is not more than half the work in covering.

Mr. Wedge: I will say that one of the great bugbears in grape raising is summer pruning, which I have practiced with some care, although I am doing less of it every year. In my visits to the vineyards of northern Iowa, none of which are very extensive, few of them comprising an acre or more, I saw they practiced very little summer pruning, almost none at all. It seems to be in general disfavor. I did not go to the

large vineyard of Mr. Wilson, which is considered one of the best conducted vineyards in the state of Iowa, but I learned from those who had worked in his vineyard that he practiced little or no summer pruning.

Mr. Brackett: Does it depend upon the variety? Does a man have to do more pruning in some varieties than in others? I understand from Mr. Latham that he does not prune his Delawares as closely as he does his other varieties. In trimming my own, I trimmed them all and left just one leaf to each lateral, until they commenced growing so fast that I thought it was not policy to take the time, and then I adopted our secretary's method of using a sickle in cutting them after they reached the upper wire. It has answered very well, although my vineyard was not a success this year on account of the mildew, I suppose.

Mr. Cutts: I know of several small vineyards where they have summer pruned very heavily in past years, and the Delawares never ripened at all. Some pruned very extensively and left the fruit exposed and the fruit never ripened at all.

Dr. Frisselle: I think the summer pruning is desirable, as a rule, especially where the vines appear to the very rampant, and where there is a great deal of foliage. On the other hand, it is by no means wise to take the foliage from the vines too much. If you do, you are sure to spoil your fruit—if you trim off too many leaves your fruit will not ripen at all; if you leave on a good supply of leaves, your fruit gets sweet. It is the leaf that does the work; it is the leaf that elaborates the sugar for the fruit, and without it you cannot ripen fruit. If you will notice in vineyards where there has been some mildew, and the foliage has been a good deal damaged, you will see that though your fruit may be colored up pretty well, yet the quality is very poor; it has been injured by the evaporation of the sap by the leaf. The more rampant the growth, the more you should prune, but I should be careful always to leave plenty of foliage.

In my vineyard, which is composed mostly of Delawares, I allow the vines to grow to the top of the wire, and make a good deal of a top over the wire, and this abundance of foliage, like a little umbrella, almost protects the fruit below, and when it rains the fruit is not wet. It also keeps off the sun and frost. Grapes do not need any sunshine on the fruit. The best fruit is grown where the sun never shines on it; but

the sun should shine on the leaves. For that reason I should recommend that vineyards be planted with the rows running north and south. I planted my own with the stem of the plant inclining at an angle of about 45 degrees toward the north, so that when I come to lay it down it goes down readily. As I lay them down every year, they become accustomed after awhile to it and do not make much resistance, although they are quite large, some of them having been planted some eight years, and some of them even longer than that. The rows being planted north and south, you get the full benefit of the sun on the leaves. In the morning the eastern side is flooded with the sunlight, and at high noon it is directly over the rows. In the afternoon the western side becomes flooded with sunlight, and that is what you want to elaborate the sap in the leaf. It must have a strong light upon the leaf, but the fruit does not need it. I had a friend who took away all the leaves so that the sun shone directly upon the fruit. He was waiting there last autumn for it to ripen, and I don't know but what he is waiting there yet. [Laughter.]

Mr. Sampson: There is one remark that the doctor made that I would like to take up, and that is in regard to planting north and south. I think that all vine growers plant according to the slope of the ground, running their trellises sideways of the hill, so that the wash may not be lengthwise of the row. I think that the doctor made an error in recommending anybody to plant their vines north and south or in any other particular direction, on that account. I think he knows it is necessary to plant sideways on a hill.

Mr. Brackett: I would like to speak in regard to fertilizing grapes. I have not heard anything said about that this year so far, nor last year. I was thinking the other day why it would not be a good idea to mulch under the vines for purposes of fertilization, and for the purpose of keeping down the weeds. We know that the cultivator cannot keep the weeds down under the vines; we have to go over them with a hoe in order to do that. There is another reason, which is this, it will prevent the wash. I would like to know if the members would not consider it a good plan to take coarse manure and mulch under the vines. The next point is in regard to the time. Last year and the year before, we used up a good deal of time tying up the vines according to the books, whose instructions I tried to carry out. This summer I found that by taking a shoot and standing it up between two other vines, or taking a double

twist between a couple of wires, that in a day or two the tendrils would attach themselves to the wires so you would not have to tie them. Once in a while we had a heavy wind which would break them loose, though, after they became attached.

Mr. Murray: I believe that the ground needs all the sunshine it can get. Last summer I lost three-fourths of my crop because I could not get sunshine enough. I am, therefore, not in favor of mulching. Here is another point about trimming. I lost my whole crop five or six years ago by trimming very closely; I took away too many of the leaves. I do not see how you are going to let the laterals grow down on your lower buds without ruining your spurs. It seems to me you must pinch off the laterals for three or four buds, and after that you need not be so very careful. Taking, for instance, such a vine as the Delaware, after taking a little care in the way I have described, I can then go over the rest with a sharp hooked sickle, and a pruning with that will answer very well. I think it would be well to be careful to leave enough foliage above those two or three buds.

Some gentleman suggested the idea of training higher. My idea is that I would set my posts six feet high, if I could, as it would be vastly easier to handle the grapes and would insure a circulation of air that would ripen more grapes. I think, in running my branches up I would run them a little more forward. Our grapes are separated ten feet, and although my ground is worth $500 an acre, if I were to plant more I would do the same thing, and would plant nearer together in the rows.

Some one has suggested fertilizing. I wish somebody capable of answering that, would do so. Can we use ordinary fertilizers on these vines? Last year I put on some ordinary stable manure, deciding to take the chance anyway. Another thing, we should plant such vines as the Moore's Early, as the gentleman from Wisconsin suggested last year, in the shape of a fan, or in some other way that would give us a better crop of grapes.

Mr. Brackett: I want to have Professor Green answer that question in regard to mulching. I happened to be over at the Experiment Station this summer, and I saw a side hill there, that used to wash very badly, that they had literally covered with hay, which seemed to improve it. Now, in regard to trimming, I was over to Mr. Latham's place last summer, when Mr.

Latham's grapes were ripe, and mine, although I do not suppose anybody could have spent more time than I did, were behind.

President Underwood: I would suggest that many of these valuable points might be brought out in the next paper, and with your permission I will ask for the next paper, which is to be read on this same subject. This is by a woman, and what the men don't know, the women do.

A WOMAN'S EXPERIENCE IN VINE CULTURE.

MRS. SOPHRONIA ERWIN, EXCELSIOR.

I never intended to afflict the public with an autobiography, but that this assembly may understand just how much grape culture means to me financially, it seems almost necessary to review a little of my past history, which I have no doubt has many counterparts in every section of our land.

Twenty-one years ago. when my husband, after a long, severe struggle, yielded up his life for his country's sake, I was left in full possession of a little home up on Laurel avenue, valued at that time at $13,000, and $5,000 in money, bearing interest at the rate of 10 per cent. Being without a debt in the world, this ought to have been a sufficient sum with proper economy to have supported myself and three little ones, the youngest then under a year old; but the trouble was that the knowledge of economy was an unknown quantity, and experience had to be purchased at a high premium. I knew nothing whatever of making purchases at a grocery, having made them before my marriage only under my mother's direction, and afterwards delegating that disagreeable business to my husband. I had never, so far as I can recollect, been inside a butcher's shop, and wood offices were to me only another term for wood lotteries—paying my money and taking whatever was sent—and this same unfitness to cope with the realities of life held good on every line. I knew it and felt it keenly, but the remedy for its relief came to me in very small homeopathic doses. Added to this, sickness was constantly in the house. Much of this I now know was due to my ignorance, also.

Is it any wonder that in a short time I began to find my interest very inadequate to the demands upon me, and the principal to melt away, I could scarcely tell where? Then came the pressure of necessity to do something to eke out the remainder of my income and stop, if possible, the drainage upon the principal. But what? My own health was miserable and my children were susceptible to every current disease, besides the inheriting of an unusual amount, and too young to allow to suffer from the least neglect, so I must be constantly in my own home. I could only attempt what has brought such untold suffering to so many over-burdened mothers, sewing, and through one winter I struggled along with the machine needle, helping myself in a wonderful manner, or so I thought, but in the early spring came a time when my health gave way to such an extent that my physician told me, that if I had any relatives with whom I could wish to leave my children, I had better go to them immediately.

I went South, and while cares and burdens fell thick and fast upon my shoulders, strength also came to bear them, so that, at the end of two years, instead of leaving my children to the care of others, I returned to Minneapolis to resume the fight for existence with a very small income indeed. It was a hand to hand fight, I assure you; sewing, then boarders, housekeeping, etc., until the great real estate boom struck our city, when I was enabled through the sale of my one house and lot to begin to step out of the slough of financial despair.

I might interline this little synopsis of the first years of my widowed life with enough to fill a large volume, but I pass on to the grapes.

I had such a growing estimation of real estate that 40 or 50 or even 60-foot lots held no more attraction, and I longed to possess something I could denominate "acres." I had no choice of what grew on those acres, whether berries or beans, so long as they had water privileges and some trees, and so for months I was a constant caller on real estate men. (Many of those have since quit business.) Through this medium I visited nearly every addition in Minneapolis,—and I will say, in this connection, that I will gladly furnish free information to any one desiring it of any location within a radius of 10 miles of the city.

But, it was not till May 9, 1889, that I saw my present home on Christmas lake, and saw, for the first time in my life, a vineyard. The land was just what I had been looking for, and the bargain for it was closed that very day. Some months before, a young man in business then in St. Paul had promised me, jokingly, that if ever I bought a farm he would run it for me, and I now wrote him, claiming his promise. In a few days he came out with me to look over the situation; he had been used to farms with many acres of grain, but was as ignorant as myself on the grape question. So, after taking the little patch carefully in, he replied, with decided sarcasm: "Well, this isn't much, but I want to leave St. Paul, and I suppose when I am not busy here I can find plenty to do among the neighbors." I feebly assented, for to me those long staring rows of brown stubs were possessed of great possibilities, and I think my feelings were akin to those of a young chicken taking its first peer at the world—"it's very large and I may get lost, but I am in for it. so I'll commence to scratch."

There was neither house nor barn on the place, only a little berry house or two, and taking into these such articles as we must have, we commenced. There were 900 Delaware, 1,100 Concord and about 200 mixed varieties of grapes, about an acre of blackcap raspberries and, probably, 100 small apples trees on the land, the remainder being covered with trees; and skirting the entire eastern front was the desired water privileges. To say that none of us knew anything about grapes does not in any wise express our ignorance, nor is there any single word in the English language that will.

We had everything to learn. The vines had already been raised from their winter bed and fastened to the first wire of the trellis, and the buds were bursting a little, but seemed to grow very slowly. "Never mind," said the man of whom I had purchased, "they will soon climb fast enough. Will six inches per 24 hours suit you?"

I thought him jesting, but have since learned to credit everything in that line. It is not necessary to detail here the wonderful things that first summer's work made manifest; every grape grower knows them—the

awkward complication of the grass knot, the endless pinching, the anxiety of about how much foliage to take, how much to leave; where to leave fruit branches for the next year, and how many of the sweet scented blossoms to cast away, making room for others to mature. Our hearts were altogether too tender on this last point, and, while we rejoiced at the large results of the year's labor, we did not realize that we had laid the foundation for future disease and loss. When winter closed in on us we had laid our vines away, with no desire to return to the city's busy whirl, since we had built very comfortable winter quarters for ourselves and the little stock we possessed.

During the winter we were constantly making preparations for increasing our varieties of small fruits. We had plenty of grapes, and when spring came added quite a number of berries to our plantation. These, of course, made more work and workmen necessary, but we started out with a great deal of assurance. Wiser heads than ours hinted at queer little formations on branches of certain wild trees, and carried uncertain airs about the outcome, since the analysis developed a caterpillar known to be very destructive in other parts; but with the assistance of a neighbor we barricaded ourselves with a barrel sprayer which, in conjunction with certain compounds recommended by the Government School of Agriculture, was insured to kill every living thing within its reach. It requires no stretch of memory to go back to the time when the enemy burst upon us, not in weak numbers which could be easily cut off and so leave no chance of progeny, but with a force so overwhelming, so far reaching, so near reaching, that the hairy, squirming, crawly, creeping things literally took possession of us and ours. Not a plant of any kind escaped. Our gardens were taken by storm; from our apple trees waved their filmy banners; while about our houses, clothing and beds, they compared very favorably with the frogs of Egypt. Every man, woman and child, who owned a home was on the defensive, while campers and summer visitors fled to the city for safety.

Added to these, other pests made their appearance. Cut worms kept onion and cabbage beds clean; a small green insect covered the plum trees; currant worms on the currant bushes; an almost imperceptible beginning of mildew on the Delaware, and later on, little spots on the Concord grapes: and we felt we were in for it. The sprayer was rigged and manned and went forth to battle, and day after day, as I looked out from the windows of the sick room where I was then keeping watch, I could see a man skillfully guiding a two-horse wagon upon which was the barrel sprayer up and down the lines of grapes, while two others followed drenching the vines on either side from a hose, and a fourth played up and down upon a pump handle, thus supplying the warranted fluid. It was an imposing array, I assure you, and left its impress of blue on every vine, bush and tree with which it came in contact. The ground was blue, the wagon blue, and a blue line marked its path to the next neighbor. I do not yet know if a smaller quantity of material and less marked efforts would have answered the purpose at that time, but the treatment was effective to a great extent. The caterpillars, I think, stayed their time out, but the seasoning of their food injured their appetites and caused many deaths; but many wove their cocoons and prepared for another summer's campaign. The insects on the plum trees flourished upon

the blue treatment, but we afterwards gave them a heavy kerosene emulsion, which killed them and the trees also. To the Delawares it proved a wonderful preventative to mildew, so giving us a well rounded crop of grapes. But not realizing the necessity of its constant use upon the Concords, the black rot played sad havoc, and I think we lost fully one-third of our crop. Thus ended the second year.

At the beginning of the third year, the young man who had charge of my place went into business for himself, and I filled the vacancy with one of the graduates of our own agricultural school at St. Anthony Park, a quiet, industrious young man, but an ardent admirer of bugs, worms, etc. Again we began to prepare for battle, throwing up entrenchments, building drawbridges and arming ourselves, not with a barrel sprayer this time, but simply a knapsack and a much smaller quantity of ammunition. Again our memories do not need prompting to recollect how spring came upon us last year, the long weeks of cold and almost ceaseless rain, when our hired men, after doing every possible job of work that could be done under cover, waited, waited, waited for warm sunshine and dry weather, until every past record for beginning vineyard work was broken. How gardeners became thoroughly discouraged with planting costly seed and watching it—not grow—but float away to the nearest ravine, thence to the nearest lake. How, when the warmth and sunshine did finally come, the rains did not cease, and earth and air combined to produce a murky, humid atmosphere, very productive of flying, creeping and crawling things.

When our grapes were finally raised, large buds were already upon them, which the intense heat, closely accompanied with heavy showers, forced into a speed of growth, which has never been exceeded in our Northwest—with every tiny leaf of the Delawares showing mildew already upon it. The caterpillars came also from their incubators with an increase of audacity over last year's crop—great fat, rollicking fellows, with all their wisdom teeth cut and destruction imprinted in every wriggle of their ugly bodies. Is it any wonder that my man of war would start with "knapsack strapped upon his back" and wonder which way to fire to do the most effective work?

For six long weeks nearly every morning the click, click of the little machine came in from the strip of woodland that skirted the red raspberries, and in the afternoon from the vineyard, while at midday it occasionally poured fire over the potato patch or apple trees. So constant was its use that man and knapsack seemed inseparable companions. Mildew and caterpillars, Bordeaux mixture and London purple were the common themes of conversation; and the war was waged with unremitting energy. It often seemed that we were defeated, and the greatest amount of perseverance was necessary to enable us to see any advance upon the enemy; but, finally, the caterpillar strength was spent, and the clouds left off their endless lowering, and hot days followed, leaving mildew the only foe in sight; and upon this we continued battle, not realizing that again black rot was working upon the Concords to an unpleasant extent. We found this out at harvest time, when our Delawares, which had received the greater attention, yielded the most beautiful and uniform and plentiful clusters we had yet received, and the Concords, while yielding heavily, were sour and unsatisfactory, while those of

my nearest neighbor, which had received more attention, were perfect, healthy and sweet.

I have had so many questions asked me in regard to spraying, also in regard to woman's fitness for grape culture—or rather its fitness for woman—that I scarcely know how to answer all in the brief time I ought to occupy here, so I will simply say that I do most implicitly believe that every garden patch and fruit grower ought to own a sprayer. In my own little garden patch, it has more than earned its cost this year. In the grapes it has proved its priceless value. I never saw such heavy foliage as clothed my Delawares this year, or such luscious fruit, and I know that any loss that I have incurred was due to not using it often enough. I owe a magnificent crop of raspberries and a heavy yield of apples to its service, also, and I would say especially, let every grape grower possess a sprayer before another season opens.

There are other foes lurking about our vines than mildew or black rot, four different species were found upon my own this summer, rose chaffer, leaf roller, thrips or aphis and blue caterpillar; and we can not tell which of all these will claim supremacy next season.

As to the suitableness of the work for women, why not? Any woman of average strength and average sense can do it. Do it all, except the post planting and cultivating, and these she can hire done for a small sum. It is easy work, it is healthy work; it can not be otherwise with the purest of air surrounding us all the time. It is fascinating work, because there is so much to learn, not learn once for all, but like millinery, school teaching or any other feminine employment that has advancement in it, something to learn each season, something that delights and elevates until you forget or cease to care if your hands grow brown and rough or your city friends know you only at your own home, or if your neighbors think you queer because you can't keep out of the vineyard when it is apparent there is enough for you to do in the house.

It is elevating work; it lifts you into the book world, you find you can not get along without them; and we older people have been crying out so much for knowledge that our state has found it necessary to establish schools for the purpose of fortifying itself against the question of the next generation.

It is profitable, financially. I will simply give you my amount of grapes for this year, and you can estimate for yourselves at a reasonable market price. From 900 Delaware vines, 6,372 pounds; from 1,100 Concords and 200 mixed grapes, 1,300 vines, 9,456 pounds; total, 15,828 pounds. This only includes those that were sold, not making any account of those consumed by from eight to fifteen persons constantly about the house, numerous visitors, those put up for winter use and at least 100 baskets otherwise disposed of. Besides grapes, planted in wide rows as mine are, you have room for as many vegetables or small fruits as you can possibly care for, on the same land; consequently, when winter comes on you have the comfortable assurance of a well stocked cellar.

And far more than all these considerations, the work brings one into nearer relationship with Him who has said: "I am the Vine, ye are the branches. As the branch can not bear fruit of itself, except it abide in the vine, no more can ye, except ye abide in Me," and so, although work may crowd upon us, a loving, kindly feeling springs up that never could be engendered, if miles of waving grain separated us from our neighbors.

DISCUSSION.

President Underwood: Now, this question of vine culture comes up for a more detailed discussion, and I understand the secretary wishes to say a word before the general discussion is taken up.

Secretary Latham: I wish to say a word in regard to the subject of mildew, which Mrs. Irwin has treated to some extent in her paper. It is a subject of great importance to vine growers, and if you live in a community where you have not had any mildew, it is simply because the day is put off a little while. We have it out at the Lake, and we must look after it. Last year, those who gave it a thorough treatment, like Mrs. Irwin, had no mildew to do any injury. I received a few weeks ago a copy of a bulletin sent out by the Department at Washington, entitled, "Plant Diseases." In looking it over, I found it contained so much of practical value that I sent for fifty copies, and they are here at this meeting. I hope that every one of you who grows grapes will carry one of these home with you, as the book contains just the information you are looking for.

Professor Green: In bulletin 25 of the experiment station, Mr. Pratt, who worked for Mrs. Irwin, has a full report of the expense of spraying, etc., connected with the work done at her place. There are some copies of it here on the table, if any of you would like to see them.

President Underwood: I hope the matter of fertilizing grapes as well as the others, will be taken up and discussed very thoroughly.

Professor Green: The subject of the fertilization of grapes is quite an important one. Very elaborate experiments have been carried on in the East, but up to the present almost nothing has been done here. The experiments in the East have shown that they got the most benefit from manures that were not nitrogenous, but were rich in potash, etc. Nitrogenous manure is not generally considered very desirable in a vineyard, and yet it may be used to some extent. If anybody here has a vineyard that is not making growth enough, he would not have any serious trouble follow from a light application of manure.

The question asked by Mr. Brackett was about mulching a vineyard. The vineyard he referred to at the agricultural college is located on a gravelly knoll, that slopes to the south. I found when I came to the farm that they were doing pretty well, but the drought prevented the grapes from

doing anything for a year or more, and, rather than lose them, I thought I would go to work and mulch them. The land was quite steep and was washing badly, and I made up my mind I would mulch them. The following winter, after the dry summer of 1889, I think, I mulched quite heavily with stable manure, and as a result they picked up a good deal the next year. It was mulched in such shape that I could work it into the soil, and it changed the whole character of the land; instead of being a land that would wash badly, it became much like a new forest mould, resembling land first broken up. I mulched it again last season, because I was afraid to trust it, and the result was that we got a very good crop of grapes, indeed. I do not want you to understand that I would recommend mulching grapes; I think, on clayey land it might be a very bad thing to do. I should not recommend anybody to do it, unless they were very careful about it, but if you have a gravelly soil and cannot grow them any other way, I would recommend you to set the grapes deep and mulch them. There is this objection to it, especially in clay land, that you make the ground very cold and bring the roots near the surface. I am afraid that if they are too near the surface, they will be liable to kill some winter when we don't have much snow. But, between growing them or not on a gravelly knoll I would mulch them. In answer to Mr. Brackett's questions whether I would recommend him to mulch his vineyard on such good grape land as he has, I will say that I do not believe I would do it.

Mr. Murray: You could also use stable manure on the gravelly land—I mean more than on the clayey soil.

Prof. Greene: Yes, and if your land is run out you can get better results. I have had the fertilizing business drilled into me. I have talked potash and magnesium time and time again, but when I came West and tried to follow out what I learned in the East, it didn't work. In Massachusetts and in, practically, all the states east of Ohio, and even in parts of Ohio you get the same result when you use potash salts. They recommend potash salts on land with very good results, but here we get almost no results at all.

Mr. Murray: And how about nitrate of silver?

Prof. Greene: It has given wonderful results in stimulating the leaf growth. Of course, any of these nitrogenous salts are especially stimulating to the leaf growth. For that reason they are not desirable for use on grape vines. On spinach and like plants in the spring of the year, upon which it is desirable

to force a large leaf growth, nitrate of soda has a most wonderful effect in giving an early leaf crop. It is the thing to use for that purpose, but it should not be used on grapes. I do not think there is any need of buying high-priced fertilizers in our state, because we have such a great source of cheap manure. We have lots of stable manure and we have tankage. Tankage can be bought at New Brighton for twelve dollars a ton. It is perfectly dry—you can keep it in a perfectly dry room, and there will be but little odor to it. It is the cheapest fertilizer I know of. I would not advise anybody to buy the nitrates and those compounds which are high-priced, just because some seedsman or fertilizer manufacturer puts them on the market.

Dr. Frisselle: How would it do to put on wood ashes?

Prof. Greene: It would be a very good fertilizer, indeed.

Mr. Wilcox: I want to ask Prof. Greene if it would not be a very cheap way to produce phosphoric acid and potash to burn bones?

Prof. Greene: There is no potash in the ashes of bones.

Mr. Wilcox: I mean by burning the bones and mixing with the acid.

Prof. Greene: Yes, but you would lose your nitrogen by burning them.

Mr. Wilcox: But how about using them for manure for grapes?

Prof. Greene: If I used the bones I would never burn them, if I could get a grinder such as Mr. Brackett has to grind bones for his hens. I would grind them and mix them up with a little wood ashes, or put them in the hot stable manure where they would ferment and become soluble; in that way they would be much more valuable.

Mr. Morris: I have several thousand vines growing at Minnetonka. Some of the ground is very sandy. Two years ago I fertilized them. All the growers discouraged me at the time. At the time the American Association of Nurserymen was in session, Mr. George S. Joslyn of New York, one of the best posted men in the United States in vine growing, said that he put the common manure on his vines all the time and worked it into his soil well, and it didn't hurt them a bit. Two years ago I put on from four to six inches on some light soil that I had, working it in, and the result was that vines that had never amounted to anything before that and

from which I never raised any fruit, gave me almost a full crop last year. They are doing nicely now, and I think I shall give them a coat of manure next year.

Dr. Frisselle: It seems to me that the question resolves itself, so far as the manuring is concernd, to about this, if the ground is poor and needs fertilizing elements you must put that fertilizer in for the use of the plant. If it is already there in plentiful quantities, you don't need any more of it. Now, you take our virgin soil, and the ground is rich in humus and potash and everything needed for plant growth. Therefore, you do not need to put on any nitrate of potash nor carbonate of potash nor any other potash, as we have it there already. As Prof. Greene has remarked, if the soil is poor, if it is gravelly soil without any material for plant growth in it, why, put your fertilizer in. I think that is good common sense. I am sure that the fertilizers I put on my own ground in my vineyard—good stable manure put on two or three years ago with seven or eight loads of ashes—did it much good. I should be in favor of keeping up the fertility of the soil.

Prof. Greene: There is a caution necessary to be used there, too. It won't do to encourage too vigorous a growth of the vines. I think you are very liable to have that where you have too much manure. On the prairie soil of this state, you are very apt to get a great growth of vine and a small growth of fruit. Now, if you are getting a reasonable amount of growth without the use of manure, do not use it. Do not manure it in order to get twenty feet of growth, for we don't need such a growth.

Prof. Williams: I will say in regard to manuring that on our home farm in east Nebraska, we have a very rich soil. In our vineyard we used to work in a light coating of stable manure about every three years. We find it helps the vine materially, and in very dry seasons we very frequently give a light coating or mulching to the vines, as well.

Mr. Wilcox: I would like to call attention for one moment to one feature of this discussion. Dr. Frisselle has very plainly stated an important feature in growing grapes—to procure full exposure of the leaf to the sun, while the fruit is protected in the shade. It seems to me it is very desirable to do this. You all use the upright trellis, but it is my opinion that one of the best trellises is the under trellis. By the use of such a trellis you secure the full benefit of the sunlight on the

leaves and shade for the fruit. I think it has been pretty well demonstrated that by lifting the trellis well from the ground you secure some comparative exemption from mildew.

Mr. Plants: Any one who ever visited Lake City and saw the elder Mr. Doughty's grape vines saw readily the advantage of having the vine up pretty well, so as to let the sun strike the roots. He illustrated it in last year's book--the society's annual report—and it gave me an idea in regard to putting the vines up higher, so as to give the sun a chance to strike the ground.

President Underwood: There was a point made here by some one with regard to the shyness of Moore's Early and, perhaps, some others in fruiting. I was struck by an article in one of our horticultural journals this fall, giving the experiments made at one of the Eastern stations—I think it was the Geneva station in New York—and it gave a very clear account of the experiments that had been carried on with regard to fertilization of grapes. It made it appear that it is almost as essential that we plant grapes intelligently with regard to proper fertilization of those kinds which have pistillate blossoms and are imperfect in pollen, as it is necessary in regard to the planting of strawberries. This journal gives a list of the varieties that are perfect in their blossoms, and also of those varieties that are imperfect. It appears that most varieties are imperfect in their blossoms, which makes it necessary to have varieties near them that have perfect blossoms and furnish plenty of pollen. I thought at the time that if that was the case, here was something that the grape growers ought to understand more fully, giving it at least as much attention as they do when they plant strawberries.

Mr. Murray: Is Moore's Early given as imperfect?

President Underwood: I think it is, but I have not the article in question with me. I wish I had. I am sure it is one of the reports of the Geneva station.

Mr. Wedge: Speaking about the Moore's Early being a shy bearer, I will say that at the northern Iowa meeting, which I have just attended, one of the strong points made was in regard to pruning the Moore's Early—that it should be pruned long; that there should be very little of the wood cut off, as compared with the other varieties. Prof. Budd especially emphasized that point.

Dr. Frisselle: I have had a little experience with the Moore's Early. I should recommend pulling them out in order to insure

better results, because in that way you can put in some other kind in their place. I put out two hundred Moore's Early vines and have waited several years, long and patiently, and am waiting still for the crop (laughter). I have hardly had a specimen from the vines, and I am very tired of them.

Mr. Sampson; I would ask Dr. Frisselle what variety he has planted near there.

Dr. Frisselle: I had some varieties of the Delawares planted near there and others. I am sorry to say that I cannot from my own experience recommend the Moore's Early.

Secretary Latham: I just want to say a word or two about the Moore's Early, and I am glad that President Underwood brought the matter up. I have had some experience with the Moore's Early in several places, and my success is a good deal like Dr. Frisselle's failure, except with the vines that I planted at my house. As much as fifteen years ago, I planted those Moore's Early vines there, and they have never failed to bear a good crop. They have borne what I call a satisfactory crop. They did so well that I planted a few dozen at the place which Mrs. Irwin afterwards became the owner of, but they never did anything. I planted five or six hundred in a later vineyard that I am now cultivating, and I planted this last lot before I had satisfied myself that they would not bear. When I found that the others were not bearing and that those at my residence were bearing continually, then I began to look for the cause. The home vineyard is on a northeast slope—and, without discussing the question of slope here, I want to say that the grapes I have raised in that vineyard are the grapes that have taken all the big prizes at the fairs. I do not know how much influence the slope may have on the bearing of Moore's Early, but I have ascribed their bearing qualities to the fact that they lie alongside of the Lady grape vine. It is a vine of the same nativity, being a seedling of the Concord, and blossoming at the same time, and bearing a very early fruit. I think it is fair to presume that the Lady supplies the fertilizing power that the Moore's Early lacks. I had so much faith in this that I went out in my large vineyard amongst the Moore's Early, and digging up every fourth vine, planted a Lady in its place. That was done three years ago, and they began to bear a little this spring. Next year, I may be able to tell you more about it.

Mr. Morris: Can you get your arms well branched on the Moore's Early?

Secretary Latham: Yes, you can always get branches enough in the proper place. I want to say a word about this matter of pinching, while I am on my feet. I heard some statements here that I do not exactly agree with. Somebody said that by pinching too close, you would not get fruit, etc. It is true, you must not take the leaves off; if you go into the vineyard and take many leaves off, you do serious harm in proportion to the number of leaves you take off; but there is one safe way for you to pinch the vines, and if you want to get large, compact branches of fruit, you must pinch and pinch close. If you want to get spurs, the buds on which are well developed, you must pinch and pinch close.

The way to pinch is to begin when the new growth has reached that point where the blossom appears. There is the place to pinch, and you should do it at once, and not wait until you have to pinch off three or four or half a dozen leaves—but do it at once. It turns the flow of sap in another direction, and does not cripple the vine. You need not wait until you have a leaf three inches in diameter, but pinch as soon as you can get at it handily. Follow this up through the growing season, and you will get some fruit that will astonish you. I want to say in regard to Delawares that if you are raising fruit for market you should not pinch that way, because the bunches grow so compact that they burst before they are ripe enough to gather. When we got twenty cents a pound for grapes, then it paid to pinch and raise splendid bunches. Now instead of using the finger and thumb for pinching, I take a corn knife, but I do not wait until I have to take off a great mass of foliage. Instead of doing that, I go over them every week, and it is not much work to take care of them that way.

Mr. Cook: I have a little delicacy in speaking of grapes before these Minnetonka grape growers, but I cannot sit here and hear the Moore's Early mentioned unfavorably. It is evident that these gentlemen have not the soil adapted to a Moore's Early grape. I have about four hundred Moore's Early and find it to be the best grape I have ever raised. I believe that the Moore's Early is the best grape on the list for our section of the country. Speaking of digging them up and putting Brightons in their place, I will say that at the time I planted my Moore's Early, I also planted fifty Brightons. This year I got nothing off the Brightons, while I got a good crop from the Moore's Early. They both had the same care.

Mr. Yancey: The Moore's Early is really my favorite as I have never failed in getting a fair crop at least. Yet I agree with most all that has been said by the other gentlemen in regard to it.

President Underwood: We have with us a gentleman from Sparta, Wis., who is very successful in the culture of blackberry. I understand he is also postmaster of that place. I do not know whether his official capacity makes him successful in blackberry growing or not, but I would like to have Mr. Fisher tell us about his blackberry patch.

Mr. Fisher: I don't know who has put you up to call on me, I am sure. Now, I am here to listen to-day. I am not a talker and I would like to be excused. I will say I have been very much interested in your discussions and it has afforded me a great deal of pleasure to be with you.

REPORT ON GRAPES.

DAN'L. BUCK, MANKATO.

Circumstances beyond my control make it impossible for me to make more than a brief report. My experience for many years in raising grapes is contained in the article entitled "Grapes" on page 280 of your report for 1892.

During the past year grape vines in this vicinity were free from disease. While some vineyards bore heavy crops of grapes, others were only moderately productive. The Delaware, however, seemed to bear heavily in all vineyards, and were the grapes a little larger it would be difficult to find its superior, everything considered. With me no disease has ever attacked it. While searching for new varieties, we should not overlook the great merits of this splendid grape. Further experience leads me to believe that severe summer pruning is unnecessary. This statement may draw out criticism, but I believe that close summer pruning is not only unnecessary, but with the exception of pinching back a few of the most rampant vines, is injurious, and is a source of a great deal of care and vexation. Severe fall pruning and moderate summer pruning I believe to be the better rule.

There are some drawbacks to our growing grapes in Minnesota, but I believe that grapes have less insects and diseases here than in most of the other states. Last winter I spent several weeks in Florida, and as time hung heavily on my hands I pruned about 100 grape vines for a friend, and had an opportunity of examining the growth and condition of the vine. Vines several years old were covered with insects, large numbers of them hidden under the bark, and the vines were not vigorous or thrifty. Many of our northern grape vines do not thrive well there and yet many do exceedingly well, especially the Niagara and Lindley. But the Scuppernong grape vine there is a sight worth seeing. In a few years it grows sev-

eral inches in diameter, and covers a space several rods in extent. There are from three to seven berries in a cluster. The grapes are about one inch in diameter, good to eat, make excellent wine, and the vine is wonderfully productive.

In setting out grape vines, I think we often make a mistake, and that is, in setting them too near together. Large grape vines are great feeders, and the roots run under ground a long distance in search of plant food. A friend of mine found the roots of his grape vine had run ten feet under ground, and the rootlets from it were clinging around a large bone. The large vines with vigorous roots, therefore, running long distances, rob the weaker vines of the nutriment necessary for their growth and fruit bearing. This is one reason why a young vine set out in a vineyard among old vines, where one has died out, will not grow and slowly perishes. The roots of the old vines grow deeper than the hole dug for the new vines, and the young vine cannot compete with the old ones for nourishment. Thus, we are often disappointed because the young vines set among old ones do not grow, when the fact is the young vine has been robbed of its life by the older and stronger vine. The only remedy is to dig quite deep and enlarge the hole for the young vine, and then set strong two or three-year-old vines in place of the missing vine.

Notwithstanding the strong competition which our grape growers meet with from Eastern grown grapes, yet the local prices have been quite good for home grown grapes, especially for the Delaware.

I have a fine seedling grape, larger and earlier than the Concord, which last year when fully ripe was perfectly black; this year when fully ripe it was red, the exact color of its parent, Rogers No. 15.

SMALL FRUITS.

REPORT OF COMMITTEE ON SMALL FRUITS.

L. H. WILCOX, HASTINGS

I suppose we will have to start the ball moving in some way, so I will give you a little verbal report of the small fruit crop in our section of the state, which during the last season was generally good. The strawberry crop was above the average and the fruit was nice; the raspberries were exceedingly good; blackberries not being grown very much, there were not a great many offered. I can report further, that the interest in small fruit cultivation in that section of the state has increased very much within the last two or three years. I think there were more small fruit plants set last spring than there have been set before in five years. A great many who are setting them are asking the question, "What are we going to do with the immense amount of fruit that we shall raise?" but as yet they are not troubled with not being able to market all they raise. In fact, they have never yet produced hardly enough to fill the wants of their local markets.

Perhaps I might say, personally, that I have some very fine fields of strawberries and raspberries that were set last spring. We have forty-six different varieties of strawberries in our trial bed, including all the new and fashionable varieties. (Laughter.) I won't say now which are the best varieties, because we do not know yet whether they are the best or not. We have set fifty plants of each kind in adjoining rows to give them a test. The fields went into winter in excellent shape, so we are looking forward with hope to their productiveness next season.

President Underwood: If there is anybody present who wishes to ask any questions of Mr. Wilcox, I hope they will do so. It is our intention at this meeting to offer all the opportunity desired for a free discussion of the subject, and I hope everybody will be prompt to do their part in making the meeting as interesting as it will be if you will all discuss these matters and try and get at the facts, drawing out the different speakers.

Mr. J. A. Sampson: I would like to ask Mr. Wilcox which variety of strawberries he considers the best.

Mr. L. H. Wilcox: Well, I have always been experimenting—that is a particular hobby of mine—and always will be testing something, whether it prove profitable or not. Since coming to Minnesota, I have not pursued systematic tests with small fruits and with strawberries, in particular, until this

season. Of course, the plants we set last spring have not fruited yet. I could speak of the relative vigor, or growth, and the production of plants, and I might speak of the fertilizing properties of the different varieties, from my knowledge of the variety, but not from a test on our soil in Minnesota.

I met with a little experience that was novel in some respects. I found one or two varieties of our old standards that I supposed were gone by, that had made a very vigorous growth and were in very good shape.

The subject of perfect blossoms and self-fertilization is one that is as yet very poorly understood among our best horticulturists. While we have plants of the strawberry producing perfect blossoms, we have very few plants in the system of nature that pollenize themselves, even when the blossoms are perfect. I think the result of tests has usually been that pistillate blossoming varieties prove very much hardier as well as more productive. Perhaps, some of you have not seen the account of experiments at the Ohio experiment station. The experiments of Professor Green here, clearly indicate that such varieties of plants are not only very much more productive but very much more hardy in resisting adverse conditions.

REPORT OF COMMITTEE ON SMALL FRUITS.

J. A. SAMPSON, EXCELSIOR.

In rendering my report on small fruits, I must say that I was too busy to work up the information as I would wish to, as regards the varieties to be recommended. I will leave that for the committee as a whole.

The growing of small fruit is becoming an industry of large proportions. I cannot but notice the tendency to increase in certain lines. Raspberries have been planted quite extensively the past year or two. Attention is being turned to blackberries, and I look for a great increase of acreage in that direction. The market for currants has been overstocked, especially the early varieties; the late varieties have been more profitable in consequence. Attention will be turned to the late varieties. Gooseberries are neglected. Strawberries have received a fair attention. The rust has bothered a good many the past year. I think the rust is caused in part by poor wintering. The cost and labor of planting so often has caused many to give up strawberry culture.

The growing of large varieties, according to the best of my information, has not been so profitable as the medium-sized fruit.

DISCUSSION.

Mr. L. H. Wilcox: Do you find rust on your newly set plants?

Mr. J. A. Sampson: I have not been bothered very much with rust on my plants.

Mr. L. H. Wilcox: Is it not that the beds are too dry to be run more than one year—the old beds?

Mr. J. A. Sampson: Well, perhaps, somebody else here could answer that question better. I could not say for sure, because I have not had any particular experience with the rust. The reason I mentioned the rust in connection with poor wintering was, I have noticed some plants where they had been left out uncovered, and in taking those plants up the roots were found defective; there were spots in the roots that appeared as having been caused by swelling or shrinkage of the ground, or some other cause through the freezing and thawing process.

Mr. C. L. Smith: Did you notice whether some of the varieties are more affected than others?

Mr. Sampson: I grow the Wilson principally, and I understood the Wilson had been largely affected by the rust in other fields. I would like to hear from Mr. Elliot, if he is in the room, as I believe he has been over the ground more extensively, and also passed over my field during its fruiting.

Mr. Wyman Elliot: In the course of the investigations I have made this year, I found there were some varieties more subject to rust than others. For instance, the Captain Jack, a variety we had supposed to be one of the best fertilizers, is becoming so badly diseased that many are discarding it and looking for something in its place. On some plantations I found there was what we call "the spot disease", affecting quite a good many of the plants. It weakens the plants, and they do not throw out runners as vigorously as those that are more healthy. I think cultivators in general will have to look to their stock pretty carefully and see that they plant nothing but the very healthiest, if they wish to succeed. Of course, we are learning more each year. There are new things coming up each year to try our patience, and we shall have to be on the alert if we wish to succeed in everything we undertake.

Mr. Smith: I see Professor Green is here. Perhaps he can give us some light on the rust.

Professor S. B. Green: The rust of the strawberry is the fungus that grows in a portion of the leaves of the plant. I look upon it that the thing to do is to avoid it as far as possible, but it generally comes in a place where we cannot

avoid it, and it is necessary to use some preventative, some fungicide. There are a very few varieties not subject to this, including the Warfield and Haverland. I do not think we have a variety of strawberry but what is more or less afflicted at times with this spotting, this rusting, this disease we call rust of the strawberry, or blight. Of course, it is especially abundant in seasons when we have a great deal of moisture followed by intensely hot weather; then it grows with great rapidity. If the variety is in a weak condition and there is a lack of plant food in the soil, or a lack of moisture or anything of that sort it is very much more liable to be diseased. I should consider that the preventatives would be first, good cultivation, second, selection of those varieties that I have named, the Warfield and Haverland, as they are not much troubled with it. We must have something to pollenize those with, and I should use the Michel's Early for that purpose. It is not a very good plant, and the fruit is not very good nor very prolific, and if you think it best to use the Captain Jack you can keep it clear of the rust by using the fungicides, either the Bordeaux mixture or potassium sulphide. I think the Bordeaux mixture is the simplest and the best; you do not have to use it as often as the other. If you undertake to use such a fungicide as that, you should begin as soon as the plants are established during the first year of their crop, and spray the foliage, probably, three times to the first of September, and then let them grow; and in the spring of the year, spray them at least twice more with the Bordeaux mixture. With such varieties as the Haverland and Warfield I do not think it would be necessary to spray them; but if you have the Captain Jack I think it would pay you to get a spray pump and spray them.

Now, I will speak of one little matter that was of interest last summer. You all recollect that the strawberries growing under the shade of the trees and along the side of the buildings are generally the best. Now, I have been carrying on a little experiment at the farm, which may not be very practical on a large scale, but which is of interest in showing that the plants grown in the shade were healthier than the ones grown in the sun. They seemed to do better. The shade was made by making a screen, six feet from the ground, of poles driven into the ground and covered with brush to keep out, perhaps, one-third of the sunlight. We found that it not only kept the plants very much healthier, but that such varieties as the Parker, for instance, which is one of those growing an im-

mense amount of fruit and frequently failing to mature, matured all its fruit when grown in the shade, although it had not done so in the sun. This is of interest—coming back to the subject of the rust—to show that we must look as far as possible to the cultivation and care necessitated by the different varieties. We must also look to the resisting varieties; but we will not find any that are entirely resistant to it. There are some varieties desirable to be grown, with which it will be necessary to use the fungicide.

I would like to add just one thing more. I am in favor of growing strawberry beds, and fruiting them two years. I favor that plan. I notice this much, if you allow those old leaves to remain on a strawberry bed and try to renew it by just letting those leaves remain, and, perhaps, cutting out a little, you will not have good success. The disease we have spoken of will spread badly on the bed. If you will take a mowing machine and cut all those leaves off and burn them, you will find that the new growth that will come on the bed will be almost as healthy as a perfectly new bed. If properly manured and cared for, in the course of the year they will look like newly set plants. You can burn the leaves right on the bed. It only makes a light covering, and the weeds and leaves can be burned off without any injury to the new growth that comes up, and the new growth will be perfectly healthy. In this way you will have destroyed the centers of infection on the leaves.

Mr. B. C. Yancey, Edina Mills: It is my plan in renewing a bed to plow little strips right along the bed about a foot wide, which I manure, and then put on the cultivator, start it going and work it up as well as I can. Then I take a hoe and go over those rows and cut out the weeds and about two-thirds of the plants. The plants that are left will grow in good shape.

Mr. J. A. Sampson: I am very glad that Professor Green brought up this idea of burning the beds over. When Mr. Elliot spoke to me last season about it, I was afraid to undertake it, being afraid of injuring my bed. Consequently, I left the straw on the ground, and it was a great annoyance in getting the bed ready for another season. I would like to hear from others upon that same question.

Mr. E. J. Cutts, Howard Lake: I would like to ask Professor Green what time of the year he would do that mowing.

Prof. Green: Just as soon as you get the crop gathered. The sooner, the better.

Mr. Dewain Cook, Windom: I have had some little experience with rust, and I do not think the matter has been fully reached yet. This summer I planted a dozen Warfield strawberry plants and a dozen Sandoval and a dozen Enchants on ground that was very rich and well cultivated. Those plants were on land that never had strawberries on it before, and they were well cultivated. The Sandoval grew very well early in the season, and later died of rust; the Warfields had a little rust on them and the Enchants had none at all. It is my impression that the main remedy or preventative of rust is to reject those varieties that are subject to rust.

A. H. Brackett, Minneapolis: I understand that Professor Green brings forward the theory that the rust was caused because of the excessively wet weather, while Mr. Sampson thinks that it was from severe wintering.

Prof. Green: I said that the Warfield and Haverland are not subject to rust, but I can tell you of fifty varieties that are. The Captain Jack and Sandoval were subject to rust this year on my place. You will often notice rust on leaves in the spring of the year. Now, after you have gathered nearly all the fruit, perhaps, you will find if you have a very dry spell of weather or some other unfavorable condition, that on account of your plants being exhausted the rust starts and grows with wonderful rapidity. In a week's time the beds will be as dry almost as if they were burned. Anything that weakens the plant will allow the disease to gain a foothold, and some varieties of plants are much more subject to it than others. We have not to-day a satisfactory pollenizer that is rust-proof for those two varieties that are little affected by the rust.

Mrs. A. A. Kennedy, Hutchinson: Doesn't the different varieties of soil have something to do with it? We are not bothered at all with rust, and never have been.

Mr. Wilcox, Hastings: I want to say just a word in line with Mrs. Kennedy's suggestion. I was somewhat surprised to hear our friend Cook speak of the Sandoval rusting out completely the first season, as I have the Sandoval and have had no rust on them whatever. Of course, in saying that I do not mean that there is absolutely no trace of rust to be found on them, because some varieties, notably the Parker and the Beder Wood and half a dozen others show occasional spots, but every variety was just as green as could be desired. There was no rust on my plants to do the least harm. This was true of every variety and more particularly of the Wilson, which I set with the

expectation that with the reputation it had elsewhere made of rusting badly it would be very much subject to rust. It was one of the healthiest and stood fourth or fifth in point of vigor among forty varieties. So I feel like giving it a good mark.

Professor Williams, Brookings, S. D.: Might it not be well for us to watch the wild strawberries a little? In that way we might get considerable knowledge of that disease, as they are affected by the same rust that our cultivated varieties suffer from. We find that in some regions where the strawberry grows naturally, it is very badly affected by rust, and again, in other regions it is entirely free from it. It might be, too, that in this lies the solution to Mr. Cook's trouble. Although it was the first year that he planted strawberries on that ground, there might have been wild strawberries there, and they might have started the rust in his patch.

REPORT ON SMALL FRUITS.

MRS. A. A. KENNEDY, HUTCHINSON.

I am afraid my report will be rather meager, as my observations have been limited, but I am glad to notice that fruit raising is on the increase. When we moved into the neighborhood where we now reside, ten years ago, there were a few orchards of Transcendents; there were no raspberries, strawberries or grapes. Now, in a radius of five miles, I can count forty families that are raising more or less small fruit. But I can hardly tell what kinds are doing the best, as they have bought of agents and do not know what kinds they have.

On my own grounds the Turner raspberries have done the best. Cuthberts have never winter-killed, but are not as prolific as the Turner. Taylor's Prolific proved almost a failure. The Marlboro has not made a very good growth so far. Of blackberries, the Snyder has done the best; have not covered them; they winter-killed some. Ancient Briton and Stone's Hardy did not survive the first winter.

Of all the different varieties of strawberries I have tried, Crescent and Charles Downing have proved the best. Jessie and Bubach have been a failure so far. Have tried what we bought for Warfield No. 2 two seasons, and they have not borne a berry. Mr. Harris says they are not true to name. The Manchester does well. Park's Beauty winter-kills and the berries are not first-class. The Princess and Lady Rusk are on trial. Crescent and Glendale made a good growth, but the fruit was like angel's visits, "few and far between." I have the Monmouth and First Season on trial. The Monmouth winter-killed badly. First Season made a wonderful growth last summer; I let one stem of fruit grow and the berries were large, firm and of fine flavor; it promises to be the best I have. I received of Prof. Green, one year ago, the Pearl and Michel's Early;

they have made a strong growth. Last spring, I received from him Boynton's Great Pacific, Schuster's Gem, Lovett' Early and BederWood. They have all done well, but Beder Wood has made the best growth. On Mrs. Bonniwell's grounds: Warfield No. 2, with Capt. Jack as fertilizer, have done the best. Crescent and Jessie have done well; Bubach and Haverland are on trial; May King, Kentucky, Freeman, Jumbo and Jersey Queen are of no account. She tried the Princess three years; it has not borne a berry. Bidwell has done well.

Grapes: Of grapes she has Concord, Janesville and Delaware. Concord has done the best.

Blackberries: Snyder does well; Ancient Briton and Stone's Hardy, though covered in winter, are a failure. On Mrs. Bell's grounds, four miles southeast of Mrs. Bonniwell's, Snyder blackberry does best without covering. Tied some of them to stakes and wrapped hay around them for protection, but those left alone did the best by far.

Blackcap raspberries: Gregg does well by covering; Doolittle does well without. Gregg raspberry does well by bending down the tips and covering with a little dirt. Souhegan bears heavily but are not as hardy. Doolittle does finely, splendid. Red raspberries: Shaeffer's Colossal, with tips covered, is a heavy bearer; Hansel is hardy and prolific; Turner does the best of all. Mrs. Bell considers the Minnetonka Chief the best and most perfect strawberry she has. Finch's Prolific is very large for the first two or three pickings, but as she sums them all up she says "after all, the Crescent and Charles Downing have given the best satisfaction." Grapes: Concord, Duchess, Niagara, Lady and Moore's Early have not done as well as Janesville, Brighton, Worden and Delaware.

At one place I visited I found a prune tree growing. It is five years old and it is all of eight and, perhaps, ten feet high and 12 inches in circumference. It bore two or three prunes last year; this year it bore several. Plums were almost an entire failure this year.

At one place I called in the suburbs of Hutchinson, I found a man who had bought of an agent fruit to the amount of one hundred and ten dollars. When I spoke to the man about it he exclaimed: "What do *you* want to know anything about it for? Did you come to pay for them?" I said "No, sir! Nor to replace them either, but I would have sold them to you for one dollar a hundred, and they would not have needed replacing." I then told him why I wished to know. He said: "You can just tell them I was swindled out of one hundred and ten dollars, and that is just all there is about it." He had bought two thousand raspberry plants. At first they said they were all dead, afterward his wife said there might possibly be twenty-five alive, but doubted it. He said when he received them the roots were daubed with blue clay, and it adhered to them like glue, and he could not soak or wash it off. He said: "It sticks there to-day just as tight as when I set them." One of our neighbors bought of the same agent red raspberry plants. When I called there he told me there was not one alive. He had bought some mountain ash at $2.00 apiece. When I came home, I looked over several catalogues and found prices ranging from thirty-five to fifty cents. The editor of the Hutchinson Leader, in commenting on a farewell sermon delivered in that town said, "He roasted his flock to a religious brown." But it seems to me that such unscrupulous agents ought to be cremated, and let "go up in smoke." I am thinking it will be their only opportunity of ascension.

It would seem at the first glance as though they would do the fruit business a great injury. But when I think it over I am of the opinion that it will do more good than harm. It will only stimulate horticulturists to renewed action and serve as an impetus to the society to greater energy to bring our fair Minnesota to the front. How can we fail with these grand old heroes for leaders and these younger ones with their fire and zeal to hold up their hands? Victory is sure to perch upon our horticultural banners.

DISCUSSION.

Dr. M. M. Frisselle, Excelsior: I would like to ask Mrs. Kennedy about those prunes which she speaks of having discovered. Is it a new variety?

Mrs. Kennedy: I can not tell you anything about the variety. I simply heard there was a prune tree growing on the other side of the lake, and went over and found it. I picked some of the fruit and sent some of it to our secretary for the World's Fair. It was of good size and was really a bona fide prune. The gentleman told me that he bought the trees of an agent from Iowa. He said he bought two of them, but the cattle got in and browsed off one of them and it died. The remaining tree was perfectly hardy and showed no signs of blight.

Mr. A. H. Brackett, Minneapolis: What was the largest amount of fruit it bore in one season—how many quarts?

Mrs. Kennedy: It only bore two or three last year. This year I secured a pint. There were a number of prunes on it when I saw it.

Dr. Frisselle: How long had the tree been set?

Mrs. Kennedy: Seven years.

Mr. A. H. Brackett: Has Professor Green ever experimented in that line at the station?

Prof. Green: No, we have never done anything in that line. There are, however, several prunes raised in Russia, and there is no question about their hardiness, There are several varieties, including the black prune and the Hungarian prune. They never have fruited to amount to anything with us. We have only had them a few years.

Mr. Dewain Cook: I notice Mrs. Kennedy speaks about Stone's Hardy, and says they did not survive the first winter. I have been growing them for quite a number of years, and I consider the Stone's Hardy a hardy blackberry. I have found that any variety will kill out, root and all, if they don't have some sort of a protection. Was the Stone's Hardy top-killed or root-killed?

Mrs. Kennedy: Well, the Stone's Hardy killed at the ground with me; we didn't cover them.

Mr. Cook: I have reference to root protection and not top protection. The Snyder killed with me last winter and bore a partial crop only. Any variety will kill out, if there is not something done to protect the roots.

Professor Green: Do you mulch them?

Mr. Cook: Well, I do not very much, because I depend upon the snow, but if we have no snow I mulch them.

Mr. Wyman Elliot: I would like to ask Mr. Plants to give us his experience in raising blackberries, mulching them, etc.

Mr. D. V. Plants, Long Lake: I have raised blackberries for several years. I have raised Stone's Hardy and the Snyder, and have had some little experience with the Erie. The Erie is a good market berry but a shy bearer with me. The first crop that the vines of the Stone's Hardy bore was a very heavy crop. The Synder was a little bit shy, but since that time the Stone's Hardy has almost failed, while the Snyder has always given me a good crop, except the first year that I fruited it. I would not attempt to cultivate blackberries without a heavy mulch on the berries through the summer season, bending the berries down in the fall, and using this same mulch, that I used upon the roots in the summer to hold moisture, to cover the tops with and protect the roots at the same time. The Snyder has been a very profitable blackberry with me, and the Stone's Hardy has almost failed. I have had two very good crops and one extra one. The Snyder has always done well.

Professor Green: Have you the Ancient Briton?

Mr. Plants: No, sir.

Mr. C. L. Smith: Will you tell the society how much mulching you use and how you put it on?

Mr. Plants: I use marsh hay for mulching. In the fall when I make the ground, I bend my berries over, loosening the roots a little so they will bend partially in the root and partially in the cane, and so they will not break; then I throw dirt on the tops to hold them there, and mulch at any time after that, although it is better to mulch before freezing time, because you can throw this marsh hay on them and put a little dirt over it to prevent its blowing off. I should use on an acre of blackberries from two and a half to three tons of marsh hay for mulching. About one-third of this mulch will be absorbed, it will rot and go off, and the next year you will

want, probably, about a ton, or nearly so. The third year you will have to renew it still more, say two tons. This mulch will rot entirely and go into the soil in about three years.

Mr. Elliot: What time of year do you first put the mulch on?

Mr. Plants: At any time during November. I commence in November and put it on any time from then up to Christmas. I prefer putting it on before the gronnd freezes, as I can then throw a little dirt on the mulch, which will prevent the wind blowing it off.

Dr. Frisselle: What would you recommend to people in the place of marsh hay, where they cannot obtain the hay?

Mr. Plants: Well, the next best thing would be straw or coarse manure; that is very good. If I was going to manure blackberries, I think I would put it on top of the ground. I have never manured my blackberries, though. I think I would make a mixture of straw and coarse manure, if I didn't have the marsh hay.

President Underwood: Would you put the coarse manure on the ground at any time in the winter, if the ground was bare.

Mr. Plants: Yes, though I would prefer to put it on early.

President Underwood: Supposing the berries were already covered, what then?

Mr. Plants: Well, put it on just the same. I never tried that on blackberries, but I have on raspberries. The way I handle raspberries—that is, the way in which I think I have had the best success—is this: I set out my plants and give them a good cultivation, laying the tops over and putting on dirt enough to hold them there. Then, at any time up to Christmas, I take coarse manure enough to protect them through the winter and put it on them. Then, in the spring when the ground warms up, I take the manure off and throw it near the plant and cultivate it in. I know I manured a piece of ground before I set the plants, and I got on too much in places and it burned them, so they did not do well. You can see the difference to-day in passing by the rows on the plantation. I noticed the difference last year. You can see the difference to a row where the ground was manured before they were planted and where they were grown in the summer and manured in the fall. There was two-thirds more yield on the plants that we manured in the fall, than on those that were manured before they were set. It makes a good deal of difference. I never manure b ackberries except by marsh hay; but if I did manure them I

I should prefer doing it after they got well established, and at any time in the forepart of the winter.

Mr. L. H. Wilcox, Hastings: I would like to ask if there is any one present who has had experience enough with the Erie blackberry to be able to give an intelligent opinion as to whether it is identical with the old Lawton or not. The New Jersey State Horticulture Society two years ago came to an almost unanimous conclusion that the Erie was only a re-named Lawton. If this is the case, while I am still satisfied that the Erie blackberry is a plant of much value, still, it would be much cheaper to buy it as the Lawton than as the Erie, if they are identical.

Mr. C. L. Smith: Mr. Plants' Erie is not identical with anything in the shape of the Lawton that I have ever seen. I want to say that in examining something like fifty different plantations of blackberries and raspberries during the last two years, I have come to the conclusion that Mr. Plant is doing the best work in the easiest way of all I have seen. I saw his blackberry plantation in the spring, in the summer, and also in the fall after he had covered them with the hay and the dirt, and I can heartily commend his work. He seems to get the greatest results with the least outlay of labor of all I have found in the business. His raspberries and blackberries were bearing the finest specimens of fruit, and the vines were in the best condition of all I have seen, anywhere in the state. I, therefore, hope you will carefully consider what he said about his method of accomplishing this.

Mr. A. H. Brackett: I can verify Mr. Plants' system by the success of a neighbor of mine, who treats his berries in the same way. I think he gets the highest price for his blackberries of anybody on the lake. They are very large and sell at 20 cents a quart. He raises the Snyder berry.

Mr. J. O. Barrett, Browns Valley: In my late trip up in the woods between the 46th and the 47th parallels of north latitude, I found growing there in great abundance a large number of wild blackberries. Of course, I took special pains to investigate the cause of this, and discovered that in those localities where the leaves of the trees had fallen quite profusely around the vines, thus properly protecting them, and where they were properly protected by the trees, that they appeared to be very prolific and very healthy. On inquiry I learned that they were

a success, except that the early frost would injure the buds, the germ in the flower, and then, of course, it was a failure. This season there was quite a crop up there.

Mr. Elliot asks the question whether we can raise black berries without covering them. It seems to me, if we copy nature that we can. If we plant an abundance of forest trees, so that the leaves can fall around the roots and prevent an excessive freezing of the ground and the vines receive a proper protection from the forest trees, not too much shade, but just enough, I believe, judging from the data of my observations in that far northern country, that we can make it a success. I inquired of a gentleman by the name of Haynes, who is quite a horticulturist in his way and who has a number of blackberries on his premises, and he stated that he had some blackberries taken from their wild state, whose fruit grew larger and was far superior to our cultivated berries, that are so popular, besides being very hardy. It seems to me by a proper selection and protection we can make a success of raising blackberries without the tedious process of covering them in the winter.

President Underwood: Will Mr. Plants tell us how many acres of blackberries he has under cultivation, and what the nature of his soil is?

Mr. Plants: The acreage is very small, less than one, and the soil is a heavy clay. Speaking about the Erie and the Lawton, now, the only time that I ever saw the Lawton growing in any quantity was in Illinois. My neighbor there had three or four hundred plants for family use. My Erie is a very different berry from that, does not resemble it at all.

Mr. L. H. Wilcox: Perhaps, I ought to say I have come to the conclusion myself that the Erie is being put out by the best horticulturists as a different berry from the old Lawton. I have the Lawton under cultivation, and it far exceeds the Snyder adjoining it. It is the best one of five varieties which I have.

Mr. William Urie: While Mr. Barrett was speaking I thought of the time, about two years ago, when I picked two quarts of beautiful berries, grown on heavy clay soil, shaded in the afternoon and getting the sun in the morning. I have been there now nine years, and in the nine years I have only had two crops of berries. They have winter-killed scarcely any, but they have failed to bear.

Mr. B. C. Yancey, Edina Mills: I feel very much interested in blackberry culture; I have about fourteen acres in blackberries myself, and I would like to ask these gentlemen a question or two. I have found out by experimenting on my plants that the Ancient Briton has done the best with me, although I have some Snyders that yield very abundantly. The Ancient Briton is very prolific on my clayey soil. I found out that my best and earliest berries came from the spots where the sun did not strike at all, I believe. In keeping with this idea, in covering my bushes I bend them as far as possible to the north, and when I uncover them in the spring I do not make them quit straight, I let them be a little angling, believing that the new canes coming up on the south side will act as a protection. I have found that those berries grown in the shade are larger and better, being really finer fruit and ripening fully as early. I have come to the conclusion, after trying both ways, that I get the best crop of berries by letting the berries come down to the ground and mulching heavily. Cornstalks make a very good mulch, and so does moist hay. Let the berries come down to the mulching or just a little higher than the mulching. I find they yield better if you let them have their own way about this and protect them by this mulching, than they do if you wire them up. My experience has been that the Snyders do reasonably well, but with me the Ancient Briton is the best, decidedly.

Mr. A. H. Brackett: I wish Mr. Elliot would give us his experience in that line. He advised my going to see some blackberries that were treated somewhat in that fashion.

Mr. Wyman Elliot: I suppose Mr. Brackett refers to Mr. O. H. Modlin of Excelsior. He has two rows of blackberries, about twelve rods long, and his method of handling them is similar to Mr. Yancey's, the last speaker. He mulches his berries very heavily, six to eight inches deep, and when he takes them up in the spring, he just lifts them above the mulching and lets them lay right on the mulching. That gives a chance for the young canes to come up and serve as a sort of shade and protection for the fruit. He certainly gets the finest crop of berries of any man that I know of. The year before last he raised on those two rows $73 worth of fruit. I do not know what he did last year, but I was there this summer and examined them, and they were very heavily loaded. I examined several plantations of blackberries, and I did not see any that gave greater promise than they did.

Dr. M. M. Frisselle: How wide apart were the rows?

Mr. Elliot: The rows were planted orginally about six or eight feet apart, and he let them occupy that strip of ground.

Mr. Cutts: When did he cultivate?

Mr. Elliot: He does not cultivate at all. He uses mulching entirely.

President Underwood: Will Mr. Yancey please tell us how many berries his plantation yields?

Mr. Yancey: I have only four acres of berries that are full grown yet. I think I can raise about 4,000 quarts to the acre of blackberries. My ordinary yield in raspberries has been about 2,000 quarts, and I think with blackberries I can double the amount.

REPORT ON SMALL FRUITS.

M. CUTLER, SUMTER.

Mr. President, ladies and gentlemen:

I have little that is new to report in regard to small fruits. Our market growers have become rather conservative in regard to planting new kinds, having found it more profitable to confine their efforts to a few "old reliables."

Strawberries did fairly well the past season. My crop, amounting to twenty-five hundred quarts of fine berries, brought from $2.50 to $3.50 per 24 quart case. The first picking was made June 25th from an old bed not mulched, and the last July 24th from a new bed on which the mulching was removed from the rows about May 1st. My experience has shown me that old beds furnish the earliest berries, so I mow them over after the fruit is picked and let them stand as long as profitable. Warfield No. 2 bore its first crop the past season and proved to be a good bearer and fine shipper. Michel's Early bore a few inferior berries, and was no earlier than Crescent, which has proved to be the earliest, the latest and most productive kind I have tried yet.

Turner and Cuthbert red raspberries bore a fair crop but not as good as last year. The weather was too wet for handling them, so the returns were small. Blackcaps produced a fair crop and were in good demand.

Red Dutch and Cherry currants were plenty, selling in the local markets as low as five cents per quart.

Snyder, Taylor, Stone's Hardy and Ancient Briton blackberries produced a good crop of fruit. I had forty-one 24-quart cases, which sold at $3 to $3.50 per case.

Owing to the frost holding off late, grapes were a good crop. Worden, Moore's Early and Concord seem to be the best for this section of the state.

The Houghton gooseberry does well here, if properly cared for.

Our farmers are generally setting out patches of small fruits and taking better care of them than heretofore. Capt. A. L. Brown of Brownton is quite an extensive grower of small fruits for market, having several

acres of strawberries, as well as some grapes and raspberries. E. Crandall of this place had a good crop of raspberries, currants and grapes, and is one of the best and most practical horticulturists of this district. P. Ryan of this town had about sixteen bushels of Wealthy and Duchess apples, and I think was the first one of our citizens to market home-grown apples other than crabs.

I am pleased to report that our farmers are not humbugged as much as formerly. Still I believe there is room for improvement, as long as agents sell the "best apple trees on earth at $20 per dozen" and ordinary strawberry plants at $4 per hundred. I would suggest to the society that no recommendations be given a fruit, of which the stock of trees or plants is controlled by a single individual or company, and sold under restrictions. Trusting that this may be as interesting and profitable a meeting as its predecessors, I remain yours to serve.

SMALL FRUITS.

J. A. SAMPSON, EXCELSIOR.

To what shall I
Ripe fruit compare?
'Tis better than music
Blending in the air.

I cannot find words
To fully express,
Except to thank God,
And ask him to bless.

It is health, comfort and joy to all appreciative people to have plenty of nice, ripe strawberries, raspberries, currants, blackberries and other fruits in their season.

I will turn my attention first to strawberries, the first fruit of the season. Of the varieties in the catalogue, there are few which I would recommend for general culture. I grow the Wilson and Crescent.

The Wilson is a perfect-flowering plant with choice, solid and somewhat acid fruit. It stands shipping nicely, and is one of the best for canning; therefore, the result is that it stands at the head as regards a market berry. The only fault that I know of as regards the Wilson is that it is slow to propagate.

The Crescent does not give a perfect flower, but needs the Wilson or some other perfect-flowering plant with it in order that it may bear fruit. It is a choice berry of medium size, will stand shipping a short distance in dry weather, but soon softens if the weather continues wet. It is prolific in both fruit and plants—will make five or more plants to the Wilson's one.

My advice is never to try to get perfect flowering plants from a mixed bed, but to keep a supply of newly-grown plants by themselves for your next field or bed. There are several other varieties of strawberries that are profitable for general culture, but not having full experience with them I prefer not to mention them.

RASPBERRIES—RED.—I can almost see the bushes loaded with the bright fruit. I grow the Turner and Cuthburt.

The Turner is hardy, early and prolific. The fruit is of medium size and of the best quality. With me it is the standard, though some claim that the Marlboro is ahead of it.

The Cuthburt is a large, firm berry about two weeks later than the Turner, but not as hardy, and does not stand the winter as well, unless protected. The protection generally used is to bend them down and put a little dirt on the tops of the bushes.

RASPBERRIES—BLACK.—I grow a mixed variety. They are not as profitable with me as the red, on account of the extra labor required to care for them. I would recommend the Doolittle and the Souhegan for general planting, and that the rows be six or eight feet apart. In setting out a large field, I would put them in check rows, if possible.

There are two modes of handling: One is to trim them up so that they will stand alone, and the other is to put in stakes and tie them up. I have tried them both. By tying up one is more apt to exhaust the plants by over-production, and the long bushes are a great hindrance to cultivation. By cutting back the fruit is larger but not as prolific.

BLACKBERRIES—Here comes the tug of war. I have been a little delicate about beginning in the blackberry culture on account of their thorny bushes and also the need of putting them down for winter protection, but those rich, luscious berries have induced me to plant blackberries and take my chances of getting scratched. I grow the Ancient Briton and Snyder.

The Ancient Briton is the most prolific. While not as large as tomatoes, they seem to vie with that fruit in production. It is surely an acquisition.

The Snyder is about a week earlier than the Briton, but not as prolific. I consider the fruit a little ahead of the Briton in quality. I shall continue to plant both varieties.

IMPROVEMENTS IN STRAWBERRY GROWING.

L. H. WILCOX, HASTINGS.

In considering the improvements made in strawberry growing within the last few years—and, excepting soil, these embrace almost the entire method recognized as best by skillful growers—there is probably no improvement so important as the diffusion of knowledge in relation to plant life and the reproduction of species. A knowledge of the chemistry of the soil, the production of plant food, the secrets of plant growth, the functions of the roots and leaves, the construction of the flowers and the law of nature which regulates their relation to each other, the development of pulp growth at the proper time and the other vital "reasons why" are essential to understand the details of successful culture.

There is always found beyond the field of experiment an unsurveyed and almost unexplored space, covered with imaginary beauties and peopled with plausible theories, that never materialize into forms of practical use.

While we have made rapid and permanent improvement in strawberry growing, and increased the amount of and the ability to use our actual knowledge, we must still explain many of its simple problems by beauti-

ful theories, which have not been sufficiently proved to safely accept as facts. Time will only permit me to speak of a few necessary things that may help the novice to begin in the right way to secure successful results.

The strawberry is a hardy native plant in all parts of the continent, and seems equally at home from the Arctic Circle to Panama, although like most plants it is at its best for vigor and productiveness near the northern limit of its growth.

Fitted to live and endure adverse conditions, it will only prove a pleasure and a profit to the growers when given the best of culture and surrounded by an abundance of the most available plant food on which to fatten and develop its luscious receptacle.

The first improvement recognized as essential by advanced horticulturists is clean and thorough culture, consisting of a deep, rich, finely pulverized soil, in which the plant roots can luxuriate, kept moist and clean by shallow tillage after the plants are set. To attain this object we should first plow deep and fine, and, if the soil is not rich make it so. If enriched with coarse unfermented stable manure, always plow it under; if by concentrated fertilizers, apply on the surface and then harrow and cross harrow and harrow again, until the surface is a smooth, soft and firm carpet of pulverized earth. After the plants are set, continue to go over the ground at least once a week until August; don't think you must wait until the weeds get a good start before you kill them, for that is not the sole purpose of cultivation, as some suppose. But keep a light porous blanket of earth all over the surface, and, if properly done the weeds will never see daylight.

We use for this purpose in addition to our regular cultivators (which run too deep and throw dirt over the plants), extra side-pieces containing ten small harrow teeth, attached to the center-beam of the cultivator in place of the regular side-pieces. These work admirably, except after heavy rains, when the larger teeth are necessary to first loosen the surface. Narrow the cultivated space as the runners encroach upon it, and use the hoe and rake wherever there is room among the plants. Nothing will so well secure the coolness and moisture necessary to develop the healthy vigorous root growth essential to sustain and mature a large crop as this mulch, or blanket of fine earth, over the surface of the soil, and upon this root-development depends the productiveness of the plants.

Mr. C. A. Green says: "But let me tell you that it is work that brings the berries; work, I say, and hard work too, tugging and sweating. Don't take stock in those poetry fellows. Don't get the notion that a big crop of berries, growing as rank as horseradish, with gaps along the rows, came there by whistling for them. Just bet your life that the man who owns that patch nearly broke his back planting and hoeing and weeding; and, if he had'nt, he would not get any profit out of them." These are the words of one of our most successful horticulturists.

Nearly all of our best varieties set more fruit than they are able to properly mature, and the berries decrease rapidly in size after the first picking from root exhaustion; while others are always small from the inability of their roots to gather and assimilate enough food for their perfect nutrition.

Our own fields were cultivated and hoed eight times last summer, and would have been better if we had gone over them once or twice more; and no one should plant a larger area than what they are able to give at least

this amount of attention. Assuming that our plants are to have the best of culture and attention (and without this you had better not attempt to grow berries), then we should select such varieties as will readily respond to good treatment. If we think we shall neglect them just a little, select hardy kinds that will bear unimproved conditions, battle with the weeds and still produce something. A Texas steer will thrive where a thoroughbred short-horn would perish, so the Crescent and Michel's Early will live and produce some berries when better kinds would die.

If we desire to produce five hundred dollars worth of strawberries per acre, when corn and wheat average but ten or twelve, we must supplement intensive culture with a selection of plants possessing a large feeding and fruiting capacity, and furnished with a root system capable of quickly converting into fruit the contiguous food supply. Don't go to some old bed and get 99 per cent. of mixed pistillates and seedlings, the way I did once, just because they looked well and the owner told me they were Crescent and Downing, and offered to give them to me! But get the best young home-grown plants you can buy of some reliable grower, not a peddler; and, if you are not well posted in varieties, tell him your soil, location and what you want to do, and he will make you a better selection for your purpose than you can do yourself. All honest dealers desire to see their customers succeed.

In short, furnish the best plant food, and set plants that can use it.

The progress made in the improvement of varieties in recent years far exceeds that in any other branch of pomology, in fact, we lead the world in size and productiveness, if not in quality. With our improved native species—and among these we may find kinds to suit the taste and soil of every cultivator—three of the best among perfect-flowering varieties, that have been sufficiently tested to establish their merit for fruit as well as pollen production, may be described as follows:

Beder Wood is the best early bi-sexual berry yet introduced; plant strong, vigorous and healthy, with an abundance of long runners; fruit large, conical, bright red and of excellent quality but, like all good berries, rather soft for long shipments.

Parker Earle. The best late variety; unlike the Beder Wood produces but few runners, but develops large crowns and a magnificent root system, and has exceeded all others in yield for two years at the Michigan experiment station; fruit, medium to large, bright red, long, conical and of good quality; my favorite of over forty varieties on trial.

Gov. Hoard.—A very desirable, large, vigorous, rust-proof plant, with desirable characteristics; fruit large, roundish-conical, deep brilliant red and firm for a berry of such excellent quality; season, medium.

Among the pistillates we have a number of good ones, but perhaps none better than the Haverland, Bubach and Warfield to mate with the Beder Wood, Earle and Hoard for all purposes, and whoever plants the Beder Wood and Haverland for early, the Hoard and Warfield for medium and the Earle and Bubach for late will make no mistake, although they may be disappointed in finding them all ripen, at nearly the same time.

When I consider the fact that some of our best horticulturists, less than ten years ago, failed to recognize the importance of the different functions of the perfect and imperfect blossoms, perhaps I should say at this time that pistillate varieties should never be planted except in connection with

those with perfect blossoms, and, if so planted in alternate rows, will usually produce about twice the amount of fruit of their bi-sexual companions. This knowledge now so universal is another of the improvements in strawberry growing.

Thousands of new varieties are being listed every year; and, while ninety-nine out of every hundred fail to come up to the high standard of excellence set by the two or three best of former years, still ninety per cent. of all the desirable kinds for the amateur or commercial grower have been introduced within the last decade. Of the several hundred varieties carefully tested at the Michigan small fruit experiment station by that eminent authority in horticulture, T.T.Lyon, more than forty exceed both the Crescent and Wilson in productiveness, while the Parker Earle produced 475, and the Beder Wood 405 ounces. The Crescent yielded but 172, and the Wilson 166, under similar conditions, and, of the fifty most promising, but three or four were known to the fruit growers of ten years ago.

Many growers are deceived by seeing desirable berries described as very early or very late, and probably no single virtue lauded by unprincipled disseminators prove so seductive a trap as this. Every one wishes to extend the luxury of fresh berries over as long a season as possible, but, unfortunately, this characteristic extends to but one end of the season. The very early continue but a short time in bearing. The late are only late in commencing to ripen, and do not materially extend the season, and both are usually non-productive. T. B. Terry says: "Mr. Crawford sent me two varieties, one perfect and the other imperfect. But, nevertheless, I sent and got some of the earliest and latest berries, as advertised, afterward; and now, after eating the fruit and watching results, I am in a better state of mind for appreciating Mr. C.'s remark, 'What fools we all are, often, that we cannot take the advice of one who knows, but must each learn in the costly school of experience.'"

The Mammoth was advertised as the earliest berry out, and the Carmichael, through its originator, promised me berries in abundance long after all others were gone. These were just what I wanted, of course. As to the latter, we did not get five decent berries from twenty-four feet of matted row. The Mammoth proved no earlier than other standard kinds that were vastly better—no earlier to speak of than one kind Mr. C. sent me. I found the Gandy also advertised as the latest of all strawberries. Well, now, you know that caught me again. I did want to prolong the season a week or so. Well, it did ripen its first berries ten days later than ordinary varieties. It is a good grower, and the fruit very large and fine, but for some reason we picked the last good berries to amount to anything only about "fifteen minutes" after the other standard kinds were all done bearing. It is a late berry to begin to ripen, but did not last year hold out at the latter end of the season.

Without touching upon the improvements made in understanding the proper requirements of soil and location, or the best methods of planting, pruning, placing runners, thinning, mulching, picking and marketing, and the minor details of after-culture, I will summarize: The two great essentials for achieving successful results are through intensive culture and good young plants of varieties which succeed in a similar soil and climate.

SMALL FRUIT FOR FARMERS.

C. L. SMITH, MINNEAPOLIS.

Mr. President, ladies and gentlemen:—

I am well aware that what I shall say will be so well known to you, that many of you may think that it might better have been left unsaid; but is it not better for us to repeat over and over the things we know to be true and good, rather than waste time in discussing things hoped for or guessed at? Just as long as there are thousands of children in our state, who throughout the long bright summer are deprived the privilege or opportunity of feasting on strawberries fresh from the vines of their own gardens, scratching their hands or staining their frocks gathering raspberries and blackberries; just so long as anywhere in Minnesota there are farmers' wives, who, desiring to furnish their tables with something appetizing, are compelled to resort to prunes and dried apples; aye, until every farm and every village garden is planted with strawberries, currants, gooseberries, raspberries, blackberries and grapes sufficient to supply the family with fresh fruit all summer and canned fruit all winter, we ought to go on telling the old, old story, "how to grow small fruits," until every one has heard or heeded it.

This society has for twenty-six years preached the gospel of fruit culture to a skeptical and unbelieving public; many have been converted and made happy, but many yet grope in the darkness of ignorance, indifference or unbelief.

How to live and live well is the most important question for all, both in a moral and physical sense. It is not an exaggeration to say that bad food, unpalatable, indigestible, unsatisfying to the appetite, has much to do with bad manners and morals. The acidity of luscious strawberries and other fruits partaken freely throughout the summer would do much to correct the acidity of disposition, generated by toil in the field or around the kitchen stove. To teach one farmer how to grow small fruit for his family, and arouse his ambition so that he shall do, it is a work worthy of highest commendation, for it makes many lives brighter and happier. There can be no better work, for the Divine Teacher of Nazareth said, "Inasmuch as ye have done it unto the least of these, ye have done it unto me."

HOW TO DO IT.—Select ground naturally rich or made so with barnyard manure, plowed deep and well pulverized, if not naturally well drained; and let it be so arranged that no water shall stand on the plants at any time.

SELECTING VARIETIES.—Select only well-tried sorts, such as are commonly planted by market gardeners for fruit. The Crescent strawberry fertilized with the Wilson, the Countess or Captain Jack have generally proved very satisfactory. Plants of these may be secured at merely nominal prices. The farmer who wants berries for his family to eat should not waste time or money on new varieties; leave those to the professionals or amateurs who spend money or work for fun.

Strong plants from last year's runners should be set as early in the spring as the ground can be worked. The roots should be kept cool and moist while out of the ground. While setting carry the plants in a pail or pan with an inch or two of muddy water to keep the roots damp, as they dry very quickly if exposed to sun and wind.

Lay off the plot to be planted in rows four feet apart. Set the plants twelve to eighteen inches apart in rows. One of the simplest and most satisfactory methods of setting plants is with a spade. Shove the blade down six or eight inches, press it over and back, making a V-shaped hole. Spread out the roots in this hole, with the crown of the plant even with the surface of the ground. Set the spade back about three inches; shove it down below the roots, and then press forward, packing the soil firmly the entire length of the roots, leaving the plant firmly set. It is important that the roots should go down their full length, that the soil should be firmly pressed against them and the crown be exactly level with the surface, neither above nor below.

Cultivation should begin in a few days, and be kept up throughout the season. When the runners appear, they should be thrown along the row, where they form matted rows of plants. If the work is well done, these matted rows will be sixteen inches to two feet wide by the middle of August. At that time, the bare ground between the rows may be mulched four or five inches deep with fresh-cut slough grass or wild hay. As early as the ground freezes, cover the plants along the row with a light litter of leaves, hay or corn stalks, anything to cover them, but not deep enough to smother or rot them. Early in the spring, rake the coarsest of the mulch from the plants, just enough to allow them to grow through, leaving it between the rows, where it retains the moisture and keeps down the weeds. If Crescent or other of the imperfect or pistillate sorts are used, every third row should be planted to Wilson or other perfect-flowering variety.

Raspberries may be planted either late in the fall or early in the spring. Rich, moist ground is best, clay or clay loam being the kinds that yield the largest crops. The red varieties are the favorites. They are propagated from suckers, young shoots coming up from roots; those from a new plantation being much better than those from an old lot. They should be planted three to four feet apart in rows eight feet apart. Set them as deep as they grew before, firm the soil around the roots and cut the cane down to within a few inches of the ground. If fruit blossoms appear, pick them off. Cultivate early and often, and as soon as new shoots are started cut away all of the old cane.

The first year, the canes should be pinched back when they are two feet high. After the first year, they may be allowed to grow to three or three and one-half feet before pinching back. Cut away all bearing canes as soon as the fruit has been gathered. This cutting out the bearing canes as soon as they are done bearing, greatly strengthens the new canes, hastens maturity and increases hardiness. As soon as the weather becomes cold in the fall, bend down the canes, fastening them with a shovelful of dirt, then cover entirely with soil, straw, slough hay or corn stalks. The cultivation should be continuous unless the ground is mulched deep enough to maintain moisture and prevent the growth of weeds or grass. Uncover the plants about the 1st of May. Blackberries and black raspberries require the same general cultivation; the black raspberries being propagated by rooting the tips of the canes, but the blackberries by suckers, the same as the red raspberries.

Of varieties, the Cuthbert, Turner and Brandywine for red, the Gregg, Souhegan or Hilburn for black, are any of them good enough, and will

give a good yield of fine fruit if properly cared for. Shaeffer's Colossal, a large purple raspberry, is becoming very popular as a farmers' berry. It is large, very productive and of fair flavor.

Two hundred to three hundred hills of red raspberries and one hundred of blackberries make a goodly amount for a farmer's garden.

Currants and gooseberries grow and bear well all over the state, when they are kept clean from weeds or grass. The Red Dutch and White Grape are old, well-tried sorts, that give universal satisfaction. Propagated from cuttings of the young shoots, one or two-year old plants are sold cheap; they bear transplanting well, and begin to bear the second year from planting. The suckers should be pinched out so that only three to five stalks are left, these being renewed from time to time by cutting out one or two old ones each year and allowing new ones to take their place. They will stand very liberal manuring and respond readily to high cultivation. Weeds, grass and drouth are their worst enemies, but they are easily conquered by cultivation and mulching.

Grapes should be found in every garden. They simply require room to grow, thorough cultivation, careful pruning back each fall, laying down and covering with dirt or straw; the entire details of which are furnished by the reports of this society and the agricultural press. In conclusion, I wish to appeal to every citizen who has a farm or garden to grow berries. If you don't know how, you can easily secure the necessary information. Do not make the mistake that, because you would rather ride a reaper or hold down a cracker box while you talk politics in the country store than to work in the garden, you can buy berries cheaper than you can raise them. If you do, your family will have to do without the berries. As a matter of economy, in the interest of health, morality, happiness, peace, content and home comfort, grow berries for self, for family and for friends, who always stand ready to pay you good money for good berries. The business is not overdone; there is no prospect of its being overdone for many years to come. There is no other direction in which the owner of a farm or garden can invest a measure of time and money that will so certainly bring large dividends of profit to the entire family as the purchasing, planting and caring for a reasonable amount of small fruits.

DISCUSSION.

Mr. L. H. Wilcox: Mr. Smith makes one point which I prize very highly, and which I have been preaching for many years, the system of setting early in the season; but my experience this last season convinces me that, if a farmer cannot set out his strawberries early in the season, he had better set them out a little later rather than not set them out all. I had several varieties that I received from Professor Green late in June, and I set them out against my judgment at that time. I believe they are equally as good as any that were set out earlier in the season.

Mr. J. A. Sampson: I will say that the best results I have ever had with strawberry setting have been attained in setting them out when they were two-thirds grown. It was at a time

when the ground was so dry that in running the dibble you could not press a hole open to set the plant in without the dry dirt running back into the hole again. You will be surprised when I tell you that I had better success than with the early plants, those that were set earlier in the season. In setting the late plants, I had one crew go ahead and make the holes, and another crew with water. Just as the plant was laid over the hole a little water was thrown on, which dampened them so that the earth adhered to the roots, and the crew pressed the plants into the holes and pressed the dirt back with another dibble. They grew right up finely. I had two crews employed, who kept the thing going as I have described, and I had the best luck with that field that I have had with any in my experience.

Mr. C. L. Smith: I appreciate what the gentlemen have said about this, and I think I see the reason in it. When a man sets out plants late in the season under such circumstances as Mr. Sampson has related to us, he knows it is a little risky, and, consequently, he takes a little more pains with them than he otherwise would, and, therefore, he has great success. I can also see how Mr. Wilcox succeeded during the last part of this season. You know the early part of the season was very backward, and the hot weather was retarded for several weeks. But, after all, gentlemen, you who are familiar with the subject will bear me out in this, I think: Where strawberries are to be moved any considerable distance, packed in baskets or boxes of any kind, it is a dangerous transaction for all parties concerned when the weather becomes hot and dry. In other words, while strawberries may be moved and set in any month of the year, the risk increases as you get into the season, and it requires more care and attention late in May or early in June than it does early in the season. I would, therefore, maintain the point made in the paper, that the safest and best time is as early in the season as the ground can be easily worked.

Mr. M. A. Thayer, Sparta, Wis.: You advise the pinching back of the raspberry and blackberry at two or three feet high—have you ever tried it a lower height?

Mr. Smith: Yes.

Mr. Thayer: And you like it better at two or three feet than you do at twelve or fifteen inches?

Mr. Smith: I never like to give advice that I know will not be taken, and, consequently, I took the medium ground, where I thought it would be heeded and perhaps, arouse no antagonism.

I will say that on my own grounds last spring I had a lot of Brandywines that I wanted to make a nice showing of next year, and I pinched them off at sixteen inches and kept them there.

Mr. Thayer: We people from Wisconsin want to get all the information we can without it costing us anything. [Laughter.] We want to know which is the best way to grow raspberries, and if it is best for us to leave them until they get to be two and a half or three feet high, we want to know it, because we have been pinching them lower down. I pinched my plantation at twelve to fifteen inches, and many of them at ten inches.

President Underwood: Do you get a very vigorous growth on your ground?

Mr. Thayer: Yes, I get a very vigorous growth, and the more vigorous the growth, the more necessity for low pinching. In that way, canes are not so liable to be injured by the wind. If you get a bush clear up here, two and a half or three feet high, there is a large to pleft to it, and, in a strong wind, it is very apt to be broken. I would pinch every blackcap I have at twelve inches high, if I could. The branches are then lower down and are better adapted for laying down in the winter, besides being less liable to damage in the wind. That has been my experience, and our experience in Wisconsin.

Mr. A H. Brackett: Do you pinch the laterals off?

Mr. Thayer: No, sir, we are not in the habit of pinching the laterals off. Of course, in the fall of the year, when the laterals have made their growth, or in the spring—we then cut them back very severely. We cut them about at the bend, and make a sort of stubbed bush of them.

Mr. Plants: Some three or four years ago, I ruined a patch of raspberries by not pinching. The laterals came out and winter-killed the tip, which has a sort of stem in the end. As the laterals were frozen, there was nothing left there to break the wind, and, consequently, the next growth coming up was broken off by the heavy winds, and I came very near losing two crops, instead of one, by not pinching. My advice would be —short pruning.

Mr. C. L. Smith: I would like to inquire of Mr. Plants and Mr. Thayer if they would sanction the substitution of the words "one and two" instead of "two and three," as the height at which they are to be pinched? I mean one and two feet instead of two and a half to three feet, as I have stated.

Mr. Plants: I should say from sixteen to twenty inches.

Mr. Thayer: I would be willing to substitute the word 'one." I would not want to make any great compromise.

Mr. Brackett: Do you refer to blackcaps, red raspberries and blackberries, all three?

Mr. Thayer: I refer to blackberries and blackcaps, which I pinch at the same height.

Mr. Smith: I had a little doubt when I made the figures as to the correctness of them, because I have been going nearer the ground than that for some time.

Mr. Thayer: I had a little experience one year from necessity. There came a frost when the young shoots were a few inches high, which froze them down very low. Many of them started afterwards and made some of the finest canes we have ever had. After that I pinched lower. There is one other question I wish to ask Mr. Smith: Do you recommend the farmer to set out strawberries a foot to a foot and one-half apart?

Mr. Smith: From one foot to one and a half, I say.

Mr. Thayer: Now, is it not your experience that the strong growing varieties, like the Crescent, Warfield and others of that kind, will grow entirely too thick? I would prefer to see a farmer set his berries two and a half feet apart, instead of less than 18 inches. In our field culture we set them two feet apart in the row, and, even then, though pinching back the first runners until the last of July, we find sometimes too vigorous a growth of the plant. I think one cause of failure in growing strawberries is in allowing the plants to become too closely matted together. It gives a large amount of small fruit, but, if each plant could have three or four square inches in which to grow and from which to draw its nutriment, we should have a very much larger and finer lot of berries.

Mr. E. J. Cutts: What would you recommend as standard varieties at that distance?

Mr. Thayer: It would depend on the kind. Michel's Early makes as vigorous a growth, perhaps, as the Crescent or Warfield. If you grow the Wilson, you should place them nearer together. I would place the Wilson 18 or 20 inches apart, perhaps.

Mr. Elliot: There is one question I want to ask Mr. Thayer. I think it is applicable to this season. He recommends pinching your vines back until the last of July. Now, with a dry season, such as we have had this year, do you get a sufficient amount of vine if you do this?

Mr. Thayer: Yes, I do.

Mr. Wedge: Is your soil sandy, as it is generally around Sparta?

Mr. Thayer: My soil is a sandy loam, with portions of it a clayey subsoil.

Mr. Elliot: You do not give them any extra attention at the time they are running out?

Mr. Thayer: No extra attention, no. I give my fruit extra attention to a certain extent. I keep a cultivator running through it as many as fifteen or twenty times a season.

Mr. Elliot: I mean, do you go over them and keep soil on the runners to make them take root?

Mr. Thayer: No more than the natural cultivation, no.

Mr. Sampson: I would like to ask Mr. Thayer and others who are in the strawberry business if it makes any difference with the fruit of the pistillate varieties about the variety of the fertilizing plant; whether a solid variety of fertilizing plant will make a firmer fruit of the pistillate varieties or not; whether that combination gives us a better fruit, the same as the Crescent; whether the Wilson will make a firmer berry on the Crescent vine than some other berry which is not as firm as the Wilson?

Mr. Thayer: I do not feel able to answer that question, and I will refer you to Professor Green. I suppose it is an established fact that certain fertilizers will make a difference in the quality of the fruit.

Mr. Sampson: I mean as to one plant fertilizing another.

Professor Green: The fact of the matter is, it don't amount to very much, and I suspect Mr. Sampson knows that, too. As a scientific fact it is true, that there is some little effect produced on the part we eat, due to fertilization of the seed, but not more than the cob of the corn when it is fertilized with a different variety, as the Black Mexican corn. You must remember that the soft part of the strawberry is the cob, and you eat the seeds from necessity. In the corn you throw away the cob. In the strawberry the juicy part is the cob, the seeds are on the outside, and the cob is soft and juicy, and so we eat it; while we eat the corn, that is, the grains on the outside, throwing away the cob. There is no more effect upon the receptacle of the strawberry than there is upon the cob of the corn.

Mr. Plants: Some years ago I had the Crescent fertilized with the James Vick, and, in picking the James Vick, the rows

next to the Crescent were picked at the same time. A neighbor of mine came along and said, "These are very nice James Vick," pointing to the Crescent. I showed him the difference, then, between the two. On the rows nearest to the Vick, it took an expert to tell whether they were Crescents or Vicks. I have noticed from that time until the present that the fertilizing of one variety had something to do with the appearance and the general looks of its neighbors.

Mr. Underwood: Does it affect the quality?

Mr. Plants: It has something to do with the quality also, and it has something to do with the hardness of the berry, the firmness. Mr. Elliot was up to my old place last year with Mr. Redpath, and the No. 5 there, that was fertilized with the Captain Jack, they found was a large, coarse, soft berry. They went right down to Mr. Spait's and found the No. 5 there fertilized with the Louise, and they didn't know the difference. It looked to be the same variety. The only difference really is, that one was fertilized with the Louise and the other with the Captain Jack, and, yet, these two were supposed to be different varieties.

SMALL FRUITS IN THE BIG WOODS.

DR. M. M. FRISSELLE, EUREKA.

The requisite conditions for the successful culture of strawberries, raspberries, currants, gooseberries and blackberries, are first of all, a deep, rich soil well supplied with humus, and for all except the latter a subsoil of clay, to retain moisture during the period of ripening fruit. High ground, well drained, is most desirable, and low, level ground that is subject to standing water, even to a limited extent, should be avoided. In this state, we are fortunate in possessing an almost unlimited amount of such land as is remarkably well adapted to the culture of small fruits, and none, it seems to the writer, better suited for this purpose than the land in that section known as the *Big Woods*.

This region is a tract somewhat triangular in form, extending 100 miles from Mankato in a northeasterly direction to St. Cloud. It has an average width of about 40 miles, and contains about 4,000 square miles. It is, or has been, heavily wooded with maple, basswood, oak, elm, ironwood, etc., and the soil is deep, rich and fertile, producing readily abundant crops of grain and vegetables. My observations in this section have been confined to the region along the Great Northern Railroad from Excelsior to Hutchinson, a distance of about 50 miles, and from thence north for 6 or 8 miles further. The proximity of this fertile tract of country to the markets afforded by the twin cities of St. Paul and Minneapolis renders it especially attractive to market gardeners and growers of small fruits, as the matter of transportation is one of importance in consider-

ing the location of ground for fruit growing. Fruit farms located along the line of the Great Northern between Excelsior and Hutchinson are practically as near the Twin Cities as if they were located within 5 or 8 miles of these cities and were obliged to transport the products of their gardens and vineyards by wagons; besides the jolting by wagon carriage is much more damaging to fruit than that by railroad transportation. Another important item to be considered is the comparative cheapness of the land in this section of country. Fresh virgin soil, either cleared and under cultivation, or still covered by primeval forest, can be purchased for from $25 to $40 per acre. Twenty acres of choice land devoted to small fruits would furnish at least three active men with plenty of employment all the season round, and in the berry season would furnish work for twenty or more girls in addition; and such a farm, requiring but a small outlay at the beginning, would in a few years yield a better income than any farm of 160 acres devoted to the usual farm crops of grain and vegetables. It seems to me that in this direction is to be found the most enjoyable prosperity and financial success for any young man of enterprise who is a lover of the soil and the exhilaration of outdoor work. How much better for a young man with wife and children to live in the country, a little removed from the turmoil of the city, amid trees and fresh fields, growing crops and blooming gardens; and, especially, better for children to be familiar with nature and under its divine influences!

PICKING BERRIES, ETC.—A TALK.

M. A. THAYER, SPARTA, WIS.

I have never had any experience with apples. My experience has been with small fruits, entirely. I could give you a minute description of my methods of picking and shipping berries, if it is not out of order at this time.

President Underwood: I am sure there is nobody here who can tell us about that better than you can. We shall not have you here with us during the entire session, so we want you to go ahead and give us the benefit of your experience.

Mr. Thayer: In the handling of berries, I adopt as thorough and systematic discipline as I would with a young army, were I commander. My pickers, as they apply for positions, are required to sign an application. That application, if accepted, is numbered and filed away. The pickers are known during the season by their numbers. I have them supplied with a case, the tin case that I exhibited at the meeting last year, with a crossbar on the bottom, in which the new boxes are placed for picking. It shuts up with a little funnel at the top. They start out with a tray containing six boxes, and they have also one in a tin case. They march out by twos, and as they come to the rows number forty-six, for instance, may take the right row and number eighty, perhaps, the left. As the boxes are filled, they are removed from the tin case and placed in the tray, and when the tray is full then the number is called. These trays are taken to the packing room and examined, and, if satisfactory, new boxes are supplied and the picker given credit for the amount already gathered.

These boxes are immediately laid in the cases, and are never handled from the time they are put in the new boxes. The boxes are filled heaping full, as they will carry much better. They should be filled so full that the cover of the case will press the top of the fruit down. In that way they go to market much better than in any other. I use the five inch shallow box. I believe that it is better.

The main thing is to be strict in the picking of the fruit. It should be picked every day. Another secret in marketing fruit is to pick it before it is over-ripe. I require my pickers to throw away all berries over-ripe or a little soft. We anticipate the ripening of our fruit from ten to twenty-four hours. This should be done especially by those living back from the city, where it requires time to get the fruit to market. I expect that my fruit will be picked a little before it is fully matured; that is, the strawberries are not over three-quarters ripe when I pick them. It is so with all kinds of fruit. You cannot be too strict in the picking and the handling of it. Many fruit growers lose a great deal of their profits by undertaking to top their berries out with a better variety of berries. Now, whatever else you do, let the quality be as good at the bottom as it is at the top. Whether your customers be high or low, rich or poor, give them good measure and good fruit. You had better take your poor fruit and throw it away than to undertake to get it to market, because it ruins your reputation and ruins the balance of the fruit. (Applause.)

Dr. Frisselle: How do you manage the transportation by the express company?

Mr. Thayer: I place my fruit on the express car myself. It is taken to the depot, and I have my men there place it in the express cars.

VEGETABLES.

REPORT ON VEGETABLES.

MRS. A. BONNIWELL, HUTCHINSON.

The early spring weather was cold and rainy, which put vegetable planting off until late. Onions sowed from the 15th to the 20th of May made a fair and average crop. Early cabbages were good, but late a failure on account of the cabbage worm. Beets were good, also squashes and melons. Tomatoes were an excellent crop, although late in ripening.

REPORT ON VEGETABLES.

E. M. CHANDLER, MINNEAPOLIS.

Mr. President and members of the Horticultural Society:

As one of the committee on vegetables, I am pleased to give you what little report I have hurriedly gathered for the purpose; like many of my able predecessors, I failed to bear the matter in mind during the year and put with it the points of greatest and current interest to present to you at this time, but such as I have is yours.

As a whole, the season was a very favorable one for most vegetables raised in this vicinity. As a general crop, potatoes were good this year, although in some localities, owing to wet weather and heavy soil, they rotted badly; those raised on sandy soil more generally escaped this. Late potatoes were fairly good, and prices for all ruled good and in some cases high.

Nearly all root vegetables were very good this year; beets, parsnips, turnips and carrots turned out especially well in this immediate locality, and there has been a stirring demand for all of them, with very fair prices.

The cabbage crop was normal; early ones were especially good, late ones matured too quick on account of early rains, and, consequently, will not keep so well. But, while the early rains were a detriment to the late cabbage, they proved a boon to the early crop. Shipping demands have been good throughout the season from all parts, especially from the South. $12 to $15 per ton were the ruling prices until late in the season, when they became very scarce, and then they readily sold at $15 to $20 per ton. The supply at present is not equal to the demand.

Tomatoes were very late this season, but brought good prices. In some parts the crop was just fair, while in others it was a good crop.

Squash was hardly more than half a crop this season, owing to the early rains when in blossom. Prices have ruled very high, and growers will realize a greater profit from the light yield of this year than from the heavier crop of last year. Prices at present are $1.25 to $1.50 per dozen, or about $25 per ton.

REPORT ON VEGETABLES.

JOSHUA ALLYN, RED WING.

Mr. President and members of Horticultural Society:

Being one of the committee to report on vegetables, I will endeavor to give a short sketch of my experience and observations during the past season. The early spring work was trying on account of cold weather and late freezing; then, we had so much continual rain that plant growth was very late and backward. I think the entire season was two weeks behind usual dates; notwithstanding all this, Minnesota redeemed herself, and vegetables in my locality were fine, and the supply more than equaled the demand.

Early potatoes were very good, but late planted ones suffered from various causes, and the general crop was injured. Onions were fine in quality and brought a good price.

Melon crop was very large, although late. Cabbage with us was a failure as a crop, and I think must be a light crop everywhere, demand and prices are so good. Hubbard squash was fair, but not a large crop, owing to the heavy rains at time of blossoming. Tomatoes were extra good with us; we picked them from July 10th until October 20th, and never had such a fine, smooth, firm article the entire season; prices held firm all through. Celery was far from what we expected, still there was some raised here that was extra fine.

As for fruit, the apple crop in this county was grand; the exhibit at the state fair proved that; quality good, and an unusual quantity. Small fruit was light; plums entire failure, although the blossoms were full. Grapes were average in quality, and, owing to warm late fall, they ripened well. All things considered, we ought to be very thankful to our Heavenly Father for the bountiful supply he has given us the past year.

DISCUSSION.

Mr. Elliot: I would like to inquire of Mr. Allyn what he considers the best early potato, cabbage and tomato?

Mr. Allyn: As far as my experience has gone with the potato, I think the Early Ohio is the best. It comes in sooner than any other potato, and it is a very good yielder. Of course, if I was going to plant for the yield, I would plant the Early Maine. They come in next to the Early Ohio for yield, and are a good potato. Of course, we aim to get everything on the market as soon as possible. It is early potatoes and early fruit of all kinds that bring us the most money. In cabbages we are growing the Early Wyman, though some prefer the Wakefield. The Early Wyman has done the best with us; it forms a good head and matures early. In tomatoes, we have the Champion, the Dwarf Champion. We plant no others, except a few we plant for exhibition purposes The Champion

is the strongest grower and the most productive we have ever had, and it is easily handled. We have had the best success with it of all the tomatos we have ever raised.

Col. Stevens: Do you discard the Acme?

Mr. Allyn: We have a few to exhibit at fairs, but we have discarded them.

Mr. Elliot: I see you designate it as the Dwarf, and it is a strong grower?

Mr. Allen: Yes, it is a very strong grower.

Mr. Elliot: Why do you call it the Dwarf Champion?

Mr. Allyn: Well, it does not grow to any height, but bunches out wonderfully.

Mr. Elliot; How far apart do you plant them?

Mr. Allyn: We plant them about four feet apart.

Mr. Elliot: Have you ever practised training them on trellises?

Mr. Allyn: No, we want a tomato that we can handle without any such trouble as that. That will do in a garden where you are crowded for room, and where you want to get them up and enjoy their beauty, but we like to have them exposed to the sun and air, and ripen as soon as possible and with as little trouble as possible.

President Underwood: Have you ever tried raising them on a trellis?

Mr. Allyn: No, I never have.

President Underwood: I will say that Mr. Doughty has had wonderful success raising tomatoes on trellises. He will grow as many tomatoes on half a dozen vines that way as any one I ever saw will grow on fifty vines the other way. He gets them very early, and they are certainly the finest tomatoes that I have ever seen.

Mrs. Jennie Stager: I had a little experience in that line. For a great many years we have been troubled up our way with our tomatoes rotting, and I thought, possibly, it was because they lay on the ground. For the last two years, I have put them on a trellis and kept them trimmed, and this year I had splendid tomatoes and no rotten ones. I got them in to the St. Cloud market as soon as they did from here, and I had a large and fine crop of tomatoes.

Mr. Allyn: The secret of raising early tomatoes lies in preserving the first blossoms. This Champion does not lie down at all until it is loaded completely; then the vines will lie down, but we have no trouble with the rot. If the first blossoms

are not well fertilized, they will drop off. It is the first ones that we are after. A half dozen the first of July are worth a bushel the last of July. Therefore, we have taken pains to improve the Champion. I prize the bees very much on account of their fertilizing the blossoms.

Dr. Frisselle: I have noticed that the first cluster is very liable to decay on my vines. I am not able to ripen the first ones that set; they decay; they are knotty, and often crack and split. Have you any such trouble, Mr. Allyn?

Mr. Allyn: No, we have not had. If they are well fertilized, they will mature well. In gathering our seed, we take care that the very finest cluster of the first picking is always saved.

Mr. Harris: We sold about 5,000 bushels of tomatoes this year, I think. In past years we have put out a good many of the Champions. In the La Crosse market, we cannot do much with the Champion, as the people will not buy them. They are not quite large enough. They are just as handsome as the Beauty.

Mr. Allyn: Do you refer to Livingston's Beauty?

Mr. Harris: Yes, we have saved our seed and think we have improved on them. We get perfectly smooth, large tomatoes from them. Now, you cannot get more than half as many of the Champion as you can of the Beauty or Favorite, unless your ground is very fertile.

Dr. Frisselle: What is the remedy for the rot?

Mr. Harris: I don't know of any perfect remedy. Some varieties rot worse than others. I have tried copperas water and also hypo-sulphite of sulphur. I think that helped them.

Mr. Allyn: Did you ever have any rot on the Champion?

Mr. Harris: We had three good pickings from our other varieties before we got one from the Champion.

Mr. Allyn: Did you give the Champion the same chance as the others?

Mr. Harris: Yes. We raised them in hot beds and transplanted once or twice in the open ground. We can get just as early a tomato from other varieties, sowing the seed the same day.

Mr. Sampson: I am very much interested in this discussion on tomatoes. The tomato is one of the most profitable and healthful fruits we produce. I calculate I sell about one hundred dollars' worth annually. I grow the Livingstone's Perfect Tomato; it has kept up with any of my competitors in early bearing and good quality. I tried the Acme, but was obliged to give it up on account of rot.

Col. Stevens: I would like to ask Mr. Allyn if he has ever raised the new variety of potato that has been recently introduced here by Mr. Dunn, called the Everett?

Mr. Allyn: I tried to get some of the seed, but I didn't succeed.

Col. Stevens: I think it is the coming potato. It is certainly better than the Early Ohio; it is several days earlier, and it yields double what that potato does. The quality is equally as good. I believe that Mr. Dunn raised ten or fifteen thousand bushels last year, and I think he is disposed to scatter them throughout the state and not charge a large price. It resembles the Ohio some, and it is somewhat the color of the Early Rose. I think it is, undoubtedly, the coming potato, and if any of you will send to Mr. Dunn, he will be glad to supply them at a moderate price. He lives at Princeton. His address is Robert Dunn, Princeton.

Dr. Frisselle: I would like to hear from Mr. Allyn his opinion why the cabbage crop was so poor this year?

Mr. Allyn: I cannot give a general reason for the failure. Of course, the location and the unfavorable weather has a great deal to do with it. It was very unfavorable at the time we set our plants; it was warm and dry, and there were hot winds.

Dr. Frisselle: How about the cabbage worm?

Mr. Allyn: We were not bothered very much with the worm this last summer.

Mr. Chandler: What time did you set them?

Mr. Allyn: The last of June or the first of July.

Mr. Wilcox: I know we had an immense crop of cabbage in our section, and shipped cabbage from Hastings to St. Louis and Chicago all the fall.

Dr. Frisselle: I think the cabbage crop in our neighborhood was an exceedingly poor one. I have never noticed them selling as high as they are now, which I think is an indication of their scarcity. The people in our region of the country complained very much of the cabbage worm. Most of the plants that were set out were destroyed entirely by the worm after they had grown some and come to a head.

Mr. Wilcox: It was not the scarcity here that made the high prices—it was the scarcity south.

Mr. Chandler: I was rather surprised to hear Dr. Frisselle say that there was a poor crop. We set out in the neighborhood of 100,000 heads and had the finest crop that was ever raised. All our crop was laid in the cars and shipped, as far away as Texas, some of them.

Mrs. Stager: The cabbage was destroyed to a great extent all over our section. The worms came in thousands; so thick that one could not use powder to get rid of them. Mrs. Blackwell says it was the same at their place. I know my own were entirely destroyed.

Mr. Harris: The cabbage worm was worse over a great portion of the Northwest this year than it has been for a number of years. The farmers in the southern part of the state were very generally short on cabbage. Early cabbage was not very seriously injured, but the late heads were kept trimmed down to the bare stems by the worms.

Mr. Barrett: What will forestall this plague of the worm? What is the best remedy to stop the ravages of the cabbage worm?

Mr. Cowdrey: I am a stranger here, but I would like to say a word. Last fall, while riding, I came across a very handsome cabbage patch; the farmer who grew them was on the spot and I commented upon it, and, finally, I asked him some questions in regard to cultivation, etc., and how he had preserved his cabbage in such a fine condition. I asked him what his remedy was for the cabbage worm, and he told me. (Reads) "Mixture for cabbage worms: Twice as much soft wood ashes as air-slacked-lime, and four quarts of salt to the bushel. Throw into the head while the dew is on."

Mr. Sampson: I can say that I have killed the cabbage worm with common pulverized black pepper. It can be obtained in quantity very cheap.

Mr. Allyn: One of our large gardeners heated water right in the field, and sprinkled the cabbage with it. It succeeded first rate. It killed the worm, also the eggs, I suppose. They had no trouble with the worms after that.

Dr. Frisselle: The cabbage worm doesn't like dust of any kind. No matter what it is, whether road dust or lime dust or bran, the worm doesn't like it. A gentleman in the East who had been greatly annoyed by the cabbage worm became disgusted and, in despair, threw a handful of dust into the head. He said that he was surprised at the result, for he had a good crop of cabbage. He says it will drive the worm away every time. I know of another man who puts on salt. Salt is very good for cabbage; it makes a fine fertilizer. There is another fertilizer, and that is nitrate of soda. I used some refuse nitrate of soda on my cabbage some time ago, that I obtained from a soap factory, and I never had such a wonderful crop as I had that season.

Mr. Barrett: How did you put it on?

Dr. Frisselle. I spread it on the ground and worked it in. Another gentleman told me that he used fine bran, sprinkling it upon his cabbages, and he said that it drove away the cabbage worm entirely. I suppose fine salt would do the same.

Mr. Chandler: I will say that I am using fine shorts on my cabbage, and I find it works very well.

Mrs. Kennedy: I find ashes to be one of the best fertilizers I can use in the garden. Of course, it is necessary to know how to use it and what to use it on. I find that in putting it around my current bushes, I can hardly get too much around them; but I have also found that if you put too much on your strawberry bed, it will burn it all up.

Mr. Lyons: I have used fine bran, and saved cabbage, that I wanted for my own use. It is more difficult to save cabbage for your own use than to raise for the market. I think dust has a great effect in keeping worms and flies away from cabbage.

MY FAILURE IN GROWING CELERY.

JOSHUA ALLYN, RED WING.

Mr. President: Requested by the secretary to give my experience in growing some kind of vegetable, I have selected celery, and will give failure as well as success. My first attempt did fairly well. I soon realized the growing demand, it being used by many as a medicine. I concluded to raise it in abundance. Some of my best soil I prepared in good shape and set out twenty thousand plants. They were looking fine up to the middle of July, then a few days of hot, dry winds soon changed the prospects; most of the plants died, the rest might as well, for they were so badly hurt they never came to perfection.

I concluded this vegetable needed soil different from my own land, so I rented, adjoining my own, a piece that I thought just right, a wet, springy soil at the head of a ravine, that never had washed out. I broke the land one year, and the next year, with high hopes, I set out my fine plants. They grew splendidly, and I was sure I had hit it all right. One night in July, we had a terrible storm, such as we only have in years. In the morning I found celery, soil and about all, washed away. For all I know, it may have gone to St. Louis.

There are many chances of failure with growing this one luxury; one of the worst, I find, is sun-scald. Just before time for hand-earthing, the outside leaves begin to die. This continues until nearly all are affected; then it seems to take a new start from the heart, but recovers slowly. Most we raised this year had this trouble, although some we had was fine.

A few years ago, I noticed the Red Manchester was a variety well liked, both as to flavor and beauty, also a good keeper. I sent and procured seed of the old English variety. The plants were fine. Entire crop did fairly well until fall, when, for reasons unknown to me, it became pithy, stringy and unfit for use in any shape—the entire crop a dead loss.

I do not think all have my experience, for I know there are some fine crops of celery raised in this state; but the question with me is, does it pay, with the risk, beginning with starting the seed, to the plants, to setting out, considering the hot weather, dry weather and winds, and that it requires the best soil under high cultivation? And yet, we cannot afford to stop raising it. Those who are always successful may be able to give reasons and causes whereby I have failed. To get a perfect article it must be clear, tender, crisp, with its own nutty flavor; and that article will always be in demand at a good price.

DISCUSSION.

President Underwood: I would like to ask Mr. Sampson, who had such fine celery last winter at Owatonna, to open the discussion and give us his views upon raising celery.

Mr. Sampson. Well, I have had a varied experience in growing celery. There are several things that a person must look out for in order to raise good celery. In the first place, one must be careful that the plants do not wash out or get covered up by the dirt washing on top of them. The ground wants to be of a moist character, either very loose and springy underneath, and yet so situated as not to overflow too much, or it wants to be somewhere where it will not get too dry. It must be just about right, neither too wet nor too dry.

The trouble with my ground the past season has been that in the extreme wet weather the drain in my marsh was not large enough to run off the water, and, in consequence, my celery was injured. Now, I had a marsh containing peat, and I decided that it was a good place to raise celery if it was properly drained and put in proper shape. My laborers laughed at me when I told them I proposed to put that marsh into cultivating shape. Before I began to improve it, you could not drive a horse on it. After I had succeeded in draining and developing the ground, I grew about two or three hundred bushels of potatoes on it, right from the breaking. That surprised a good many of my neighbors, who had not believed the ground was good for anything. Well, the next year I put in my celery. I sold from three to four hundred dollars' worth of celery off that piece of marsh land, and I didn't have it all planted either. I intended this year to grow seven or eight hundred dollars' worth of celery on it, but the elements thwarted my intentions, and it was a failure. I didn't sell over a hundred dollars' worth. I do not consider that I know much about growing celery yet, but I shall persevere and look forward to better results. [Applause.]

Mr. Busch: What variety of celery do you grow?

Mr. Sampson: I grow the Crawford and the Golden Heart. The Crawford is a little too pungent for early use, but for winter use, along about Christmas, it is very nice. For early market use, the Golden Heart is the favorite. It will bleach much quicker than the Crawford, as it is a more tender variety, but it will not stand as much heat.

Mr. Busch: Have you grown the White Plume?

Mr. Sampson: I have not; I have thought some of using it, but I did not believe the flavor of it was as good as the other varieties I have named.

Col. Stevens: Do you plant your celery in trenches or on the ground?

Mr. Sampson: This past season, I set it on the surface on account of its being easier to cultivate without covering up the plants, and because I could use a horse. The season before the past one, I set it in trenches.

Pres. Underwood: Is it absolutely necessary to have this marsh land? Can't you raise very good celery on good garden soil anywhere?

Mr. Sampson: Yes, I think we can; but I would not advise anybody to go into it too extensively on such land, because in extremely dry weather the celery will be apt to be tough and stringy, and it may be spongy.

Mr. Brackett: Can't you buy the young plants and transplant them instead of raising from the seed?

Mr. Sampson: Yes, you can buy them. I have to start my plants pretty early in order to get decent plants.

Mr. Brackett: I have a neighbor who takes broken tiling and puts it over the plants when he wishes to bleach them. I know it is a success, because I bought some celery from him that had been bleached in that way, and it was very fine.

Mr. Sampson: I have experimented with tiling. I took some four-inch tiling and put it over some of my celery plants, covering one plant with each tile. About a week afterwards, I examined the plants inside and found that they were completely cooked. They were dead.

Mr. Allyn: There was no chance for the air to circulate in there.

Mr. Sampson: The sun, shining on the tiling, heated it, and the inside became so hot that it scalded the plants. That is the great objection to banking in hot weather, because the ground is apt to get so hot that the celery is liable to rust and spoil.

ONION GROWING.

J. J. BASTON, ST. LOUIS PARK.

For onion growing, I would prefer a piece of land just rolling enough to give it a good drainage, but not enough so that it would wash by heavy rains. A heavy black loam, I think, is the best. Any newly cleared and broken land will grow good onions, but, if old and badly worn out, it should be well manured and cultivated for two seasons before attempting to grow a crop of onions.

After the piece of ground has been put in good condition by manuring, the next step is to prepare it for sowing. We plow our onion ground just as soon in the spring as we can possibly do it. After it has been well plowed, we give it a thorough harrowing, and, when the ground has been well prepared by this process, we go over it again with an implement called a "smoother," which is made something like a stone boat, eight feet wide and four deep, and is used to crush the small lumps which are not broken by the harrow. We either stand on this smoother and ride, or else place some heavy weight upon it which will answer the same purpose; and change about with the smoother and harrow until the land is as fine as possible.

The next work is to mark ready for sowing. We mark out our onion ground in rows fourteen inches apart, and are careful to get them as straight as possible, because then we can work closer to the row and do it easier than we could a crooked one.

Next comes the seeding, and for this purpose we prefer a Matthew's garden seeder. It is gauged for all kinds of garden seeds, and we have found it to be very accurate, and almost any person can operate one. Now comes the most difficult part of all, that of weeding and cultivating, and too much care cannot be given to this. As soon as we can follow the row we commence to cultivate, and by doing this we keep in check the first growth of weeds. As soon as weeds begin to appear in the row, we commence our hand weeding, and keep at both cultivating and hand weeding until we have a thorough mastery of the weeds.

For hand cultivator, we use the Planet Jr. double wheel hoe. For one to be successful in onion growing, he must keep the onions clean from weeds.

We usually gather our onions as soon as most of the tops have broken down, and, soon after pulling and topping, we put them in crates holding two bushels each.

The crates are made as follows: Sides and bottom of lath four feet long, ends eight by sixteen inches; put a piece of board the size of the ends in the center, the same as in the strawberry crate, and then we have just room enough for a bushel in each end. These crates we can place one upon another.

We consider the Globe onion the most profitable to grow, for the reason that a given number of Globe onions will measure up better than the same number of any flat variety, while they occupy no more room in the row.

PROTECTING VINES, ETC.—(A DISCUSSION.)

Mr. C. L. Smith: I have a little matter that I would like to have appear upon our records, if the society thinks best, because it is a matter that has attracted some attention. In farmers' institute work, when it first began, something like seven years ago, the question of protecting squashes and melons from bugs came up, and I carried an arrangement with me one season, which I had used successfully, and exhibited it at the institutes. Afterwards I published a description of it, and the reports have been so satisfactory that I want to introduce it to the society. During the winter, I make up a lot of boxes like this one I hold in my hand, and, as far as I can, I cover them with glass. If I cannot afford to cover them with glass, I use cloth. The cost of the boxes is merely nominal, almost nothing. They will not cost over three cents apiece, aside from the work of making them, and that can be done during the winter. This box with a glass 12x12 inches costs me less than ten cents; and I use these boxes to protect my melons.

I make the hills for the melons as soon as the frost is out of the ground, and, then, about the first of May, I plant my melon seeds in the hills, just as I would for field cultivation; and set these boxes over the hills and keep them there until the melon vines fill the boxes full. Then I lift them up and give them air, but I keep the boxes on the ground until all danger from frost has passed. If there should be a frost and it should kill the vines outside of the box, it does not seem to do any particular harm to the rest of them. By practicing this method, I get melons from two to three weeks earlier than they can be grown in open ground. The first melon from each hill will always sell in any community for more than the entire cost of the box and glass.

Judge Moyer: How early do you get your melons?

Mr. Smith: The earliest I raised were ready for market about the 21st or 22d of July, and I have them all through the month of August.

Mr. Sampson: I have tried that style of box with a similar glass, and it did not prove effectual with me; it was too close. The sun would overheat it, or else it would be too cold. I could not warm the ground underneath sufficiently.

Mrs. Jennie Stager: I have tried something of the same kind, and I could never have raised any melons in any other way, because, if I planted them out in the open ground, they were either frozen, or they ripened too late.

Dr. Frisselle: There is another advantage in using this kind of a box, and that is, it keeps off the squash beetles. They are very destructive unless you keep them away, and this box keeps them away until after the time of their appearance. I have tried something of the kind myself.

Prof. Connor: Would it not be a good idea to place that box over the hill a few days before you plant the seed in order that it might warm the ground?

Mr. Smith: I have never thought that there was any advantage to be gained in planting earlier than when the ground got warm, and, consequently, I have never used it that way. I recommend either glass or cloth for the top of the box.

Dr. Frisselle: Some think the cloth is much better because, if it is open, like cheese cloth, a little air will circulate through, and, therefore, it will not be so hot.

Mr. Smith: I get a circulation of air by simply putting a clod of dirt under the end of the box.

Mr. Allyn: There is a way of forwarding vines that is very handy and that enables you to do away with the box. I have arranged with several hotels where they use a good many canned goods to have them save the old tin cans, and I place those in a fire, and, in a very short time, the solder melts and the top and bottom drop off. That leaves you the outside rim; and we take those rims and tie strings around them to hold them together. Then we place them right in the top of the hotbeds. We adjust the heating manure below, and then fill in with earth and plant our seeds. You can leave them there and grow them to any size you want. You can keep them there until all danger of frost is over, and then you can set them in a box, and put the box in a wagon, and carry them anywhere you want to transplant them to. If the weather proves favorable and everything is all right after that, you will get a very early crop.

There is one more point. I saw in your report last year that you had a very interesting discussion on the Hubbard squash, and I thought I would like to ask Mr. Chandler the kind of squash that he saves for seed. The East is depending a great deal upon the West for squashes. Now, our Hubbard squashes are going back; unless we take care we are not always going to have as good a variety as we have now. I think it pays better to ship pure Hubbard squashes than any other kind. This year they are paying an enormous price for them in Boston, Philadelphia, Chicago and New York. We sell ours

right at home. Mr. Chandler is the king of squash growers in Minnesota, and I would like to ask him about keeping the seed pure and improving it.

Mr. Elliot: I do not think Brother Allyn needs to look very far for the modern squash. I had a talk with Mr. Chandler after he had been down and engaged all the squashes Mr. Allyn had, and he said to me that they were the finest squashes he had seen this year, and gave me the average weight of the squashes, which, I think, was somewhere in the neighborhood of fifteen pounds apiece, which is an extremely heavy weight for squashes of that variety. I think Mr. Allyn has just as good seed as there is in Minnesota.

Mr. Allyn: I sent for the first seed to Mr. Gregory o Marblehead, Massachusetts, and the pure Hubbard squash did not weigh over five pounds apiece. I have been trying to enlarge my squashes, and I think I made a mistake; I think they are too large for profitable shipping. What we want is to keep them in a commercial condition and demand good prices. We might as well put our land into squash growing, and make more money than we can any other way. We got seventeen dollars a ton for our squashes. It was a remarkable price.

FLORICULTURE.

THE PRAIRIE FLORA OF WESTERN MINNESOTA.

LYCURGUS R. MOYER, MONTEVIDEO.

The native prairie flora of western Minnesota will soon have passed away like the buffalo. The breaking plow and the barbed-wire fence are rapidly changing the aspect of the country. The wheat field and the enclosed pasture are almost equally destructive to the native wild flowers. A few individual plants may linger beside railways and in obscure corners, but the broad effects of the prairie flora will be gone.

Let us note down a few characteristic plants of this flora as they now are, or, rather, as they were, a few years ago.

There is a certain grandeur about our vast prairies in their natural state, but it is mingled with much that is stern and forbidding. Killing frosts come early in the autumn, and it is only by a happy accident that the prairie fire does not sweep the grass away within a very few days.

Art critics tell us that it is the low, somber tones in the landscape that are really the most beautiful. I can hardly agree with them. To my mind there is nothing more depressing than the blackened and denuded landscape left where the prairie fire has been. Snow may come and try to cover the desolation, but the first wind raises it into the air mixed with ashes and cinders, and leaves it piled in melancholy looking drifts, gray and grimy, and utterly discomfited; the effort to cover up the bleak ugliness of the fire-blackened prairie was a failure; the desolation remains as before, or is intensified.

Spring comes at last, and with the first warm days in April the Pasque-flower (Anemone patens, var. Nattuliana) pushes up its furry involucre on the dryest hill-tops, and opens its pale blue sepals long before its leaves have time to develop. The children all love the Pasque-flower. In our part of the state, they call it the May-flower. The furry coat in which it is clothed seems to protect it from those chilly blasts that Old Winter is wont to blow, when in a spiteful mood just before leaving, and it is not uncommon to find its opening flowers buried beneath an April snow. As summer advances, the leaves of the plant appear, and the seed-pods, gathered in a head, develop long feathery styles, making the plant fully as interesting as when in bloom.

Late in April or early in May, a small Buttercup (Ranunculus rhomboideus) is found on sunny hill-sides, and with it a cut-leaf violet (Viola pedatifida). The common blue Violet (Viola palmata, var. cucullata) is occasionally found on the prairie, but is not a characteristic prairie flower. Two Lithospermums (L. canascens and L. angustifolium) are conspicuous on dry grounds in May, and along with them the unassuming Onosmodium Carolinianum with its flowers, that look like buds about to open, but which never do. The Lousewort (Pedicularis Canadensis forms conspicuous patches on the open prairie, where the ground is rather moist. Hypoxis erecta, Star-grass, blooms early in May, and along with it Sysirinchium angustifolium, blue-eyed grass, the only representative of the Iris family on the prairies, so far as I know. The beautiful Violet Oxalis is found on the prairie everywhere, and persists in wheat fields after cultivation. Troximon cuspidatum, closely related to the common Dandelion, is found on dry banks and ridges. The Dandelion itself has

been introduced within the last few years, and is spreading far and wide. When the country was new, it was unknown. The Marsh Marigold (Caltha palustris) is found occasionally on low meadows, its yellow sepals shining like burnished gold. On the alkaline borders of low flat meadows, toward the last of May, is found the small, white Lady Slipper (Cypripedium candidum), sometimes literally covering the ground. It is a beautiful little flower, and so far as I know, the only orchid growing on these prairies. The pale Painted-cup (Castelleia sessiflora) is an inconspicuous plant on dry hill-sides.

To properly appreciate the Spiderwort (Tradescantia Virginica), found everywhere on the prairies, one must rise early in the morning, when the dew is on the grass. There is then a delicate freshness and beauty about its purple and blue petals, that disappears with the advancing day.

With the beginning of June, nature begins to spread forth her treasures with a lavish hand. The Pennsylvania Anemone and the long-fruited Anemone bloom everywhere, while the delicate panicles of the Meadow-rue nod in every passing breeze. Oxytropis Lamberti swings forth its purple banners on the dryest hill-sides, along with Astragalus adsurgens and Pentstemon albidus, fellow-wanderers from the far west. The delicate and beautiful Astragalus hypoglottis is common on flat alkaline land, along with the tall and graceful Zygadenus elegans. Astragalus caryocarpus, with its pinkish flowers and large fleshy seed pods, is everywhere. The Pomme-de-terre (Psoralea esculenta) with its purplish or whitish flowers nearly hidden in its hairy foliage elaborates its turnip-shaped farinaceous root on high rolling prairies. The small boy likes to dig and eat these roots, as did the Sioux indians in the days that are gone. A sister plant with silver-silky foliage (Psoralia argophylla) assists not a little in giving the prairies their prevailing gray color. On moist prairie land, Zizia cordata opens its yellow umbels everywhere early in June. Two vetches, Lathyrus palustris and Lathyrus venosus, grow with great luxuriance on low grounds; while the Willow-leaf Spiraea, one of the few shrubs of the prairie, blooms on the margins of sloughs. Among several Geums, the most striking is Geum triflorum, sometimes called Apache's Plume, beautiful in flower and fruit, and developing long plumose styles. On moist meadows, one will find Silver-weed (Potentilla anserina) and on dry ridges Alum-root (Heuchera hispida). The day-light, evening Primrose (Œnothera serrulata) opens its bright yellow flowers at midday; but one must get up early in the morning to see the equally bright, yellow wild Flax (Linum sulcatum and Linum rigidum). The showy white panicles of the northern Bed-straw (Galium boriale) are conspicuous in the latter days of June. The beautiful pink Phlox (Phlox pilosa), and the superb orange-red Lily (Lilium Philadelphicum) light up the landscape with their brilliant colors.

The azure Larkspur (Delphinum azureum) and the purple and white prairie Clovers, (Petalostemon violaceus and P. Candidus), all tall fine looking plants, bloom in July; along with two small shrubs, (Amorpha canescens and A. microphylla). July, too, brings the tall Astragalus (A. Canadensis), and the wild Liquorice (Glycyrrhiza lepidota), as well as the Evening Primrose (Œnothera biennis) and the Wolf-berry (Symphoricarpos occidentalis). Several upright Verbenas, (including V. hastata, V. urticæfolia and V. stricta) bloom in July, as well as the western Germander (Teucrium occidentale). Two members of the Four-o'clock family, (Oxy-

baphus nictagineus and O. hirsutus), grow on dry banks, and open their flowers late in the day like the Four-o'clock of the gardens. Apocynum cannabium, Indian Hemp, grows on rich prairies everywhere, as well as several species of Milkweed. The common Milkweed (Asclepias cornuti), is the species found in rich valleys, commonly near timber, while Asclepias speciosa, with its larger and more beautiful flowers, is more of a prairie species. A much smaller Milkweed, to be met with on high rolling prairies, is Asclepias ovalifolia, while the Swamp Milkweed (Asclepias incarnata) grows in wet places everywhere. The Whorled Milkweed (Asclepias verticiliata), with its narrow leaves and interesting flowers, is common on dry bluffs, while the Butterfly Weed (Asclepias tuberosa) is quite rare. Two green Milkweeds,(Acerates viridiflora and Acerates) lanuginosa, are frequent on dry bluffs.

In July, too, the advance pickets of the great troop of Compositæ, that is to dominate the autumnal flora, begin to appear. Early in the month the purple Cone-flower (Echinacea angustifolia), with its purple disk and long pink rays, blooms on the dryest prairies. Early travelers in these regions learned from the Indians to dig and chew its pepperish root as an antidote to thirst. The Ox-eye (Heliopsis scabra) is the forerunner of the Sun-flowers of the autumn. The Cup-plant (Sylphium perfoliatum), with its square stem and broad united leaves, blooms on rich ground, while Lepachys columnaris, with its long columnar disk and yellow or variegated rays, is found on dry ridges. In dry fields a wild Coreopsis (Coreopsis palmata) grows, and, on dry bluffs and sandy fields the almost leafless Lygodesmia juncea is found. In some sandy fields it is becoming a troublesome weed:

When the purple Iron-weed (Veronia fasciculata) begins to bloom on low grounds, the Compositæ may fairly be said to have the field. The Blazing-stars swing forth their gorgeous purple banners, Liatris punctata taking the lead, followed closely by Liatris scariosa. Liatris pycnostachya blooms a little later on low ground. On low grounds, too, the aster-like Boltonia blooms, sometimes covering large areas with its aster-like flowers. It is a robust, thrifty plant, much appreciated by the landscape gardeners of the East. The cream-colored Kuhnia blooms on dry banks and ridges, and with it the first Golden-rod of the season, Solidago Missouriensis. By the middle of August, a prairie Sunflower, Helianthus rigidus, is blooming everywhere on dry ground. This sunflower persists as a weed in wheat fields, and is often called Rosin-weed. A little later in the season Maximilian's Sunflower (Helianthus Maximiliani) the most characteristic sunflower of the prairies, is seen everywhere. Growing on unbroken prairie sod, it is a modest and unassuming sunflower, but it is so easily "improved by cultivation" that, whenever the prairie is broken up, it grows with greatly increasing vigor and assumes gigantic proportions. Specimen plants exceeding six feet in height, and a mass of bloom from bottom to top, are not infrequent.

Around old stables and on waste grounds, the Giant Rag-weed (Ambrosia trifida) grows with great luxuriance, sometimes reaching a height of eight or ten feet; and with it is usually to be found a tall, broad-leaved plant with inflorescence something like a Rag weed. This is Iva Xanthifolia, a weed from the far West, that does not seem to have received any English name. When it does get an English name, it is quite sure to get a forcible one, for it is mean enough to deserve it.

With the beginning of September a mass of sunflowers and golden-rods "are over all the hills." The prairie is literally a sea of gold. Perhaps, the most common Golden-rods are Solidago Canadensis and Solidago rigida, and they are endlessly repeated. To most people the repetition becomes monotonous. The poet who shall sing of the Golden-rods as Wordsworth sang of the Daffodils has not yet appeared. Whether western Minnesota is to produce that poet remains to be seen; but most probably not. The Golden-rod is too common there.

With September, too, comes a cloud of Asters of different species, some of them very beautiful. Helenium autumnale opens its yellow heads on the margins of sloughs. Several species of Artemisia combine to give the prairie its prevailing gray tint, and, with the coming of the first killing frost, the Gentian opens its purple petals on the seared and brown prairie. It is after the first frosts, too, that one notices on the prairie meadows an extremely sweet and all pervading perfume. It comes from a large species of Polyganum, the frost seeming to set free all the honeyed odors that the plant has gathered up through the summer. It is when the winds of autumn come, too, that the casual observer will notice the large Tumble-weeds, rolling like great wheels before the wind. This is another plant that is "improved by cultivation." On unbroken prairie it is inconspicuous enough, but on new breaking it grows to great proportions, and breaking loose from its roots it goes bounding off over the prairie before the autumn wind, scattering its seeds on every hand.

COSMOS.

GUST. MALMQUIST, MINNEAPOLIS.

This lovely flower should be more used by the florists than it is now, as it will flower during a season when good flowers, as a rule, are scarce; that is, during the latter part of September and October, before the chrysanthemum season commences. As cosmos has usually been grown here before, that is out-of-doors, it is more or less a failure, as the early frosts in September generally cut down the plants before they have commenced blooming, and if they are lifted before frost, and grown on in greenhouses, they are so large and take up so much room that they are, more or less, a nuisance.

Last summer, I, therefore, made an experiment, which I think solved the problem, how to grow cosmos in Minnesota.

The seeds were planted in March, and the young plants transplanted, as soon as they could be handled, into small pots. These plants commenced to bloom when quite small, and kept on blooming till after they were planted outside in June. The reason for their flowering so freely during spring was from the plants being pot-bound, and they stopped blooming as soon as they commenced growing freely outside. The first week of August, cuttings were taken from the strong top-shoots, which were then growing freely and soft. These rooted inside of two weeks, and were then planted in three-inch pots, and later plunged along the edge of a carnation bench and allowed to grow at will; only the tallest were bent over. These plants commenced to bloom the last week of September, and bloomed freely for nearly two months.

Where plenty of bench can be had, I would advise planting the rooted cuttings on the benches and treating them like chrysanthemums, and I believe they would pay well.

The flowers, when cut, last several days, and look especially graceful when used in vases.

So far there are only single varieties on the market—three or four different shades of colors of white, pink and red—but it is reported from the South that a double strain is under improvement and may soon be expected in the market.

ORCHIDS.

W. A. MANDA, SHORT HILLS, N. J.

The family of orchidaceous plants, which comprises some of the most unique, strange and wonderful productions of the vegetable kingdom, is represented by thousands of species, varieties and, of late years, artificial hybrids.

The geographical distribution of this order is very wide, inhabiting as they do all the five continents of the globe, and almost every island. Nor are they confined to a certain clime, as they are found in the tropical, temperate, as well as arctic regions; superabounding in the former, evenly distributed in the second, while in the cold regions they are sparingly met with.

Their forms and habits differ widely, according to their natural situations. Thus in the tropical countries they are mostly met as epiphytes, growing upon trunks and branches of trees, and also on rocks, but seldom on the ground, with the exception of a few, such as Cypripediums; while, in the temperate and northern zones, they are found growing either in meadows or in the woods on the ground, and are truly terrestrial. In the United States, the indigenous orchids are mostly terrestrial, with the exception of a few epiphytal species which are found in the most southern point of Florida. Thus the showy Lady Slipper, the dainty Lady Tresses, or the beautifully fringed Orchis, are members of the orchid family. Generally they are more difficult to cultivate than the tropical kinds, and thus, unfortunately, are seldom met with in gardens.

Although it is more than a century ago that the tropical kinds were introduced, it is only in the last thirty or forty years that they have been extensively cultivated and their culture perfected, so that to-day there are much finer specimens in cultivation than either the jungles of the East Indies or South America ever contained.

In the early part of their culture, orchids were mostly cultivated by amateurs; but of late years, with the simplified and easy culture and the easy way of procuring them, many florists have been induced to grow them extensively, finding a very ready sale for the flowers. Each country has a distinctive class of orchids; thus, the finest orchids in cultivation are divided about as follows: The showy Cattleya is found in an altitude of from 2,000 to 8,000 feet above sea level in Brazil, Venezuela, Colombia and Peru, and scattered through the Central American republics. The Laelias, again, have two distinctive habitats, one section of which is found exclusively in the Brazilian mountains, while the other is chiefly indigenous to Mexico and Guatemala. The Odontoglossum and Masdevallias are scattered on the western Cordilleras, from Mexico down to

Bolivia, generally on very high altitudes, some species being found pretty near to the snow line. The Oncidium is another South American genus, scattered all over Central and South America. The majority of the Cypripediums are found through the East Indian islands and, also, on the mainland, while they are also represented by about a dozen kinds through Central America. The Dendrobiums are confined strictly to the eastern hemisphere, as are also Vandas, Aërides, Saccolabiums, Phalaenopsis, Coelogyne and others; while Lycaste, Schomburgkias, Epidendrums and such kinds, have their homes in South and Central America.

Besides this wealth of beautiful kinds there are a number of hybrids which have been raised artificially in the garden, and which rank amongst the finest orchids known in cultivation. The number of these may be safely estimated in round numbers at 1,000, half of which are Cypripediums.

The prices of orchids vary considerably, according to the rarity and size of specimens, more than beauty; but the leading varieties and good flowering-size plants can be purchased at from $1.00 to $5.00 each, which is as low a price as any palm or other good plant can be purchased for. In former years, the supply of orchids came mostly from Europe, but of late years, several American nurserymen have taken up orchids as a specialty, and thus supply the home demand at much more reasonable prices than were paid before, as it stands to reason, being nearer to South America, the main home of the orchids, they can be imported into the United States quicker, and established under our superior climate.

The collecting of orchids in their native homes is one of the most fascinating, yet hardest and most dangerous, branches of horticulture anybody can engage in. Thus, the stock of orchids is provided by special collectors, which the firms dealing in such plants send out, who traverse unexplored mountains for months, enduring many hardships, as well. The orchid in its native habitat does not cost anything excepting the labor of collecting them, sometimes, from trees 40 to 60 feet high, and, again, from almost inaccessible cliffs; then comes the drying and preparing them for exporting; making the boxes, which have to be made at times from boards sawed by hand from trees:and the carrying them hundreds of miles on mens' or mules' backs up and down the ridges of mountains, until, finally, they reach the coast. The risk in importing orchids is very great, and it can be safely estimated that for every orchid that is to-day flourishing in the greenhouses in collections in America and Europe there have been at least thousands pulled from their native haunts. The orchid is as popular to-day as the rose, carnation or lily. The culture is more simple than any of the above-named plants, and every one is conceding that the orchid is the flower of the future on account of its lasting qualities. In the majority of varieties, the flowers will remain perfectly fresh on the plant from four to twelve weeks, while in the cut state, they will last two or three weeks.

In former years, an impression prevailed that orchids could be indulged in only by millionaires by reason of their supposed great cost, while, in reality, they are just as cheap as any other plant. Another fallacy was that orchids were very difficult to succeed with in growing, whereas, in experience, they are more easily grown than roses and other plants. Indeed, they may be considered the easiest of all plants to cultivate, and will thrive in any ordinary greenhouse in company with palms, ferns and foliage plants. They are easily grown if a few cardinal points are

observed. First of all, all truly epiphytal orchids need a season of rest and a season of growth; that is, when the plant begins to grow, which is generally in the spring time, but varies in different plants and species, the supply of water and the temperature should be increased; when the pseudo-bulb is nearly full grown, the plant should receive its maximum amount of heat and moisture. A temperature of 60 to 70 degrees is most suitable for the majority of orchids. As soon as the growth is completed, the plant should gradually receive more sun, air and less water, so as to ripen off the pseudo-bulb well and thus insure good flowering. After the growth has been ripened, then only enough water should be given to prevent the plant from shriveling. As soon as the buds begin to show, more water should be given to fully develop the flowers. After the flowering season is over the plant generally begins to show signs of growth, when it should receive any potting or re-basketing, if needed; if not, then only a top-dressing of sphagnum moss, and the plant may be started into growth as described.

The best potting material is good fibrous peat and clean sphagnum moss, with plenty of potsherds intermixed. Good drainage should be provided, and plants well elevated above the rim of the pots or baskets. In re-potting, care should be taken not to disturb the roots; rather break the old pot, while the basket can be set into a larger one and some material worked around. Over-potting should be avoided, and plants not disturbed or potted, unless necessary.

Orchids, as a rule, are fond of pure, fresh air and plenty of light, while many delight in sunshine. The plants should be kept clean from insects by occasional sponging, and some tobacco stems being laid on the hot water pipes from time to time. With these general cultural directions, and the brief statement with each described species, any one will be able to grow orchids without any difficulty, and reap a rich harvest of their beautiful blossoms. The Cypripediums, being terrestrial orchids, differ in the culture only that they require the same potting, but should not at any time of the year receive any rest, but be kept moist in the same way as palms or ferns.

The following are some of the most popular, showy, easiest cultivated, and most inexpensive orchids in cultivation:

Calanthe Vestita, from China. This terrestrial species is very useful for cutting purposes during December, January and February, its time of flowering. The flowers are produced thirty to fifty on long stems, and are white with yellow or red centre.

Calanthe Veitchii, hybrid. A hybrid of great merit, producing long spikes of rose-colored flowers, which are very useful for cutting, during the winter months.

Cattleya Mendellii, from Columbia. A very fine species, flowering from May to July. The flowers are large, white, with purple-fringed lip.

Cattleya Mossiae, from Venezuela. This fine plant flowers from May to July. The large flowers, which are produced several on a stem, vary through the different shades of lilac and rose, while the lip is beautifully colored with deep golden-yellow.

Cattleya Percivaliana, from Venezuela. A species flowering from November to February. The flowers are of deep rosy-purple color, with richly colored lip of deep crimson-purple and golden-yellow.

Cattleya Trianae, from Columbia. This is the most useful of all the orchids, flowering as it does from January to April. The flowers are from five to eight inches in diameter, produced two to four on the ripened bulbs. It can be grown in either baskets or in pots, in clean fern fibre and a little sphagnum moss.

Coelogyne Cristata, from Himalayan mountains. One of the finest winter-flowering orchids. It produces sprays of five to seven large white flowers from January to March.

Dendrobium Nobile, from Burmah. One of the first orchids grown. It produces freely a number of showy white and purple flowers on straight stems, in February and March. This species can be grown in pots or baskets, with fibrous peat and a top-dressing of moss.

Dendrobium Wardianum, from Burmah. This fine plant has pendant pseudo-bulbs, which are covered with very large white flowers, with purple tips and yellow throat.

Epidendrum Vittellinum Majus, from Mexico. A very desirable species on account of its color. The flowers, which are borne six to fifteen on an an upright stem, are of rich orange-red color, and are produced from May to July.

Laelia Albida, from Mexico. This is a very useful species, producing long spikes, each carrying from five to twelve flowers, white.

Laelia Anceps, from Mexico. This is a well known species, producing long spikes with three to five large rose-colored flowers, from November to March.

Laelia Purpurata, from Brazil. A grand species, producing from four to six large and fine flowers from May to July. The flower is white, with a large, bright, crimson-purple lip and yellow throat.

Lycaste Skinnerii, from Guatemala. A well known plant which sends up as many as twelve large flowers from one bulb. The color of the flowers varies through the different shades of lilac, rose and deep crimson, while the pure white varieties are very rare. Generally flowers from January to April.

Masdevallia Harryana, from Columbia. This is quite distinct amongst the orchids. The flowers are of rich hues, varying from light purple to crimson and scarlet. Flowers from April to July.

Odontoglossum Alexandrae, from Columbia. Acknowledged to be one of the finest species in existence, producing long, arching spikes of white flowers from January to May.

Odontoglossum Citrosmum, from Mexico. A beautiful plant which sends a long drooping spike of flowers in April and May. The flowers are white or rose-colored, and very sweet-scented.

Odontoglossum Grande, from Guatemala. This fine plant, known as the "Baby orchid," flowers from September to December. The flowers are very large, cinnamon-brown and yellow.

Odontoglossum Pescatorei, from Columbia. A fine species similar to Odontoglossum Alexandrae. The flowers are pure white, not so large but more numerous, on a branching spike. Flowers from January to May.

Odontoglossum Rossii Majus, from Mexico. A fine plant for basket culture, flowering from January to March. The flowers are large, pink or white, with petals and sepals spotted with chocolate-brown.

Oncidium Tigrinum, from Mexico. A very showy and sweet-scented species, producing spikes of yellow and brown flowers in the autumn.

Oncidium Varicosum, from Brazil. This species sends up a large branching spike in the autumn, with numerous large golden-yellow flowers which last long in perfection.

Vanda Coerulea, from East Indies. A grand plant, with large, nearly blue flowers produced on stems ten to eighteen together; flowering season from October to December.

Zygopetalum Mackayi, from Brazil. Fine plant, producing long spikes of violet and brown flowers, that are very strongly scented. Flowering season from November to March.

Cypripedium Ashburtoniae, a hybrid. A fine, free-growing hybrid, generally flowering twice a year, mostly in the winter months. The flower has a neat combination of green, white and reddish brown.

Cypripedium Barbatum, from India. This popular species produces its purple and white flowers freely from April to July.

Cypripedium Boxallii, from Burmah. A fine species, producing its flowers from December to February. The whole flower has a shiny gloss, while the colors are green, and rich, dark brown purple.

Cypripedium Dominianum, hybrid. This fine hybrid produces three to five flowers on a stem, with long petals, giving the plant a very graceful appearance. The colors are a pleasing combination of green and white, and the flowering season is in the autumn months.

Cypripedium Harrisianum, hybrid. A grand hybrid and a very valuable addition, as it produces flowers twice and even three times a year. The flowers are large, on long stems, and of a showy, rich, brown-purple color.

Cypripedium Insigne, from Silhet. The best known of all orchids. The flowers are produced from November to March, and last over twelve weeks in perfection on the plant, and three to four weeks when cut. The flower has a yellowish-green color, with brown spots and white border on the upper sepal. The stems are long and stout. There are many varieties of this plant.

Cypripedium Lawrenceanum, from Borneo. A grand species, with beautiful variegated foliage, and large flowers produced on very long stems, generally, twice a year. The color is brown-green, while the large and showy dorsal sepal is white with purple lines.

Cypripedium Sedenii, hybrid. A fine hybrid which produces long stems from which a large number of flowers succeed each other from October to May. The color of the flowers are several shades of deep rose pink.

Cypripedium Spicerianum, from Silhet. A very beautiful species, with white dorsal sepal, petals and slipper of a yellow-green color; a very distinct plant. Flowers from November to February.

Cypripedium Villosum, from Burmah. Another fine species producing its flowers from January to April. The color is brownish-yellow, shining, as if varnished.

HOW I GROW PLANTS IN WINTER.

MRS. MARY A. CLARK, DRAKOLA, S. D.

From my earliest recollection, I have been passionately fond of flowers, and always cultivated many fine varieties, both indoors and out, until we moved to Dakota. As we came in the winter, we could not bring any plants with us, so for a few years we tried to content ourselves with annuals, thinking that it would be impossible to keep house plants through such severe winters.

But, one day the gift of a few plants from the old home bay-window so increased my longing for them that not even the thought of 30° below zero could check it, and soon I was collecting and propagating plants with all my former fervor. I wanted this old favorite and that new beauty, until, finally, last fall found me the possessor of several hundred more plants than our windows would accommodate. So, we began looking about for some economical way of keeping the most hardy ones until they would be bedded out again in the spring.

In the East, we wintered such plants in a light, warm, airy cellar, but here ours was dark and damp, and not always frost proof, so we feared to trust them there. The cost of building and warming even a small green house, sixteen miles from town, was not to be considered for a moment, and from the shape of our house a conservatory was equally impracticable.

A pit seemed to be the only alternative, but, never having seen one nor even having read of one suitable for this climate, it was with the crudest of plans that we began preparing one. Our most definite ideas were that it must be mostly under ground, partially covered with glass and as warm as it could be made.

The result of our work was an excavation nine feet wide, eleven feet long and four feet deep, surmounted by a gable roof seven feet on the front or south side, and five on the back. The difference in the sides was made to give more light and, at the same time, to permit of banking up well on the north side.

Two double windows, four by six feet each, surrounded by a tight six inch frame, were placed on the front side, the lower edges being even with the plate. Double boards, a foot wide, between the windows, on either side and above (so as to permit of dirt being banked high over the peak and edges and around the windows) completed the covering of the south side. For extra protection, heavy mats were made to cover the glass, and two wooden shutters were fitted to the frames. These last were convenient also in summer, as a protection against hail and rain.

The gables and north side were first covered with shiplap, over which were placed two layers of tar paper, held apart by double lath to make a dead air space. Another covering of boards was then put on, and this, in turn, overlaid with tar paper. Each time the tar paper was carried over the board on the front and securely fastened around the windows. A foot or more of dirt was then put on, and, just before freezing weather, a load or two of manure was added.

As the pit was about twenty feet south of the house, it had to be entered from the outside; so a small opening was made through the ground at the east end, just large enough to admit of a steep stairway and of the swinging back of a narrow door. The doors, one opening into the pit, the other into the entrance, were fitted tight against either side of a four-inch door jamb. A frame was made around the opening, and a trap door fitted into it, to keep out the snow and rain, as well as the cold. A mat over the trap door in the coldest weather, with a little hay above it, kept even the entrance way above the freezing point. Frequently, too, we put a little hay over the windows at night. Probably, we covered the pit much more than was needful the greater share of the time, but, as we were only experimenting, we preferred to do a little extra work rather than wake up some morning to find everything frozen, besides it only took a few moments to put on the extra covering.

The inside arrangement was changed several times before it was quite satisfactory. The present one seems to be about as good as can be made to accommodate the different sizes and varieties of plants, and to use all the space to the greatest advantage.

On the south side, directly under the windows, four shelves, about a foot wide and from two to four inches apart, descend towards the center. These are used for plants that require the most sun, and for the smaller pots. Being placed so close together, they do not reach the floor by nearly two feet. This leaves a nice place under them for newly potted plants or those that are resting, while a row of dense trailing plants on the edge of the lowest shelf hides the opening, and cleats nailed on both edges of these shelves prevent the smaller pots from being pushed off.

Across the west end are four-inch shelves, rising from near the floor to the plate, and filled with plants that thrive best in the morning sun. The north side is occupied by four wide shelves a foot or more apart, so they, too, reach from floor to plate. The back part of the upper shelf is filled with climbing plants, whose vines run wild over cords laced across the rafters. In front of them and on the next shelf are the begonias, as they require so little sun, while the lower ones accommodate the tall growing plants that love the noonday heat. One shelf only runs across the east end above the door, but by means of twining and trailing plants the whole of that side, not occupied by tall plants on the ends of the north and south shelves, is covered with green. A shelf, the length of the pit and about eight inches from the peak, makes a fine place for trailing plants that bloom, while their fringe of bright blossoms and green leaves adds greatly to the beauty of the view through the windows. Two posts support the roof; around one is a handsome vine, while a tall fuchsia with the help of a lovely pink ivy geranium hides the other. In order to care for the plants, a space the width of the narrow door and two-thirds across the center of the pit was dug about a foot lower than the bottom of the pit and framed around with boards to keep the dirt in place. A board across this frame enabled me to reach the most distant plants. Such in detail was our pit.

I had no intention, when planning it, of using it for anything that would not stand a slight freeze, but, in the meantime, while it was in process of construction, or rather excavation, I had consented to teach the six-months winter school in our district, so, thinking that the plants would require less care and, possibly, be safer, everything big or little, hardy or tender, was turned into the pit to live or die as might be.

We expected to have to use artificial heat of some kind, and first tried a small oil stove, but it was defective in some way and made the air too impure. Afterwards a large lamp, that would burn twenty-four hours, was used with more gratifying results.

When the cold wave came in January, it was a question whether more cold would be let in, by going in to fill the lamp than its heat would counteract. Finally, we covered it a little closer, and for over two weeks left it to itself. It was with many misgivings that we opened the pit once more, and great was our surprise to find that the thermometer registered 45°, and that not even the tenderest plants showed signs of harm. So, after that the lamp was not lighted except when we wished to dry out the pit or to air it on cold days. There was not over a dollar's worth of oil used during the winter.

Usually, the temperature ranged from forty-five at night to sixty-five in the middle of the day; though on bright, sunny days it would sometimes rise to eighty or ninety, and only once did it touch thirty-nine.

We had thought in the fall that we would be quite satisfied with the experiment if half of the plants lived until spring.

We had no expectation of their growing to amount to anything, still less of having any flowers. You can imagine our satisfaction when they not only lived, but grew and bloomed. There was hardly a day all winter when something was not in blossom. And this, too, when, on account of being in the school room, I could give them a little care only on Saturdays.

Time will not permit the naming of the many different varieties that were wintered safely in the pit. With one exception, every kind tried lived, while many did exceedingly well. Coleus, however, positively refused to winter there, even in the warmest and sunniest places, though they seemed well pleased with their quarters last summer, and brightened up the pit wondrously with their gorgeous colors.

Bulbs did extra well. We had a fine chance to compare the growth and bloom of a half-dozen varieties of these in the pit with the same kinds, bought at the same time and place, but grown in a bay window. Ours were much finer both in foliage and flower, while they lasted several weeks longer. Begonias did exceedingly well. Even the red varieties, that usually present such a forlorn appearance as grown in the window, retained bright healthy foliage here. Ferns grew luxuriantly, roses blossomed and carnations seemed perfectly at home. Even small cactus cuttings rooted and were ready to begin growing in the spring. To be sure, there were some losses, but they were mostly caused by neglect, over-watering or lack of air. For any one wishing to cultivate a great number of plants, the pit has many advantages over the window; though the windows do not need to be devoid of flowers. A few choice plants can easily be taken at any time from the pit, to be returned again for rest when necessary, and will give a much finer effect than a miscellaneous collection so crowded together that the grace and beauty of the individual plant is lost.

Stated as concisely as possible, a few of the advantages are these:

1. More plants can be taken care of with the same amount of time and labor.
2. There is little or no cost for fuel. The atmosphere being a little moist causes a healthier growth. The cool air keeps the flowers perfect a much longer time than in the house.
3. There is no dust to spoil their beauty or to retard growth.
4. They can be sprinkled or watered so much more easily.
5. There is very little trouble with insects unless introduced with new plants.
6. They can be shut in and left weeks at a time even in the coldest weather, without fear that the fire will be too low or some choice plant be left too near the window, or that they will be over-watered or left to dry out.

A few things are essential to make a pit a complete success. It should be made early in the season, so that the plants may become accustomed to their surroundings before being shut in for the winter.

Fresh air must be given as frequently as possible, at the same time, avoiding cold drafts. This can generally be done safely in the middle of the day (except in the very coldest weather), by setting the three doors slightly ajar.

Great care must be taken in potting the plants that the drainage is very good.

It is better to under than over water, as in the damp atmosphere evaporation takes place very slowly. If at any time, by reason of cold or absence, the pit has remained shut up long, the plants must be examined for any appearance of mould on stem or leaf, for if left untouched it will spread rapidly.

It should be opened to the light and sun a few hours at least, every day if the weather will permit.

If the sun seems to wilt or burn the plants, a light shade of some kind must be put over the glass.

If the temperature is too high, the doors must be opened.

It was not a part of the original plan to make any use of the pit in the summer, but a hail storm early in the season, followed by hard dry winds and the prospect of a scarcity of water, caused us to delay and, at last, give up bedding out a great many plants that were intended for the yard. So the pit remained well filled all summer, and the plants grew and blossomed in a wonderful way. It was such a comfort when the sun was burning up, the fierce winds whipping in pieces, or the hail cutting down the plants out-doors, to turn to those in the pit and gaze on their quiet beauty unruffled by the passing breeze, and looking as fresh and dainty as though there was no such thing as a burning sun or drying winds. As the sun rose higher and grew hotter, we expected to have to whitewash the windows, but, finally, substituted a covering of cotton cloth during the middle of the day, as this could easily be removed at any time and the view through the window seemed too fine to lose—for the bright tints of the coleus, fancy geraniums and other foliage plants were blended so harmoniously with those of the flowers as to make a most exquisite bit of coloring. Nor were we alone in our enjoyment of this; people came from miles around to see and to go away with their hands filled with flowers and plants to brighten, in many instances, homes that were very barren in every way. To fully enjoy flowers one must have chance to give them with unstinted hand.

In closing, I cannot refrain from repeating a unique compliment paid to the pit by a young Norwegian, who had made various pretexts during the the summer to stop on his way to church for the real purpose, as I well knew, of wearing away one of our choicest buttonhole bouquets. One day, another young man was with him, and I overheard him saying to him, as they were looking down through the windows, "When you go down into the pit, you will just think you are in heaven."

PLANTS FOR EASTER FLOWERING.

E. NAGEL, MINNEAPOLIS.

As Easter is a day that flowers are used more than any other day in the year, and the decorations in churches and large stores seem to grow more popular every year, it is to our interest that we should find out what kind

of plants are best adapted for that purpose, and how to prepare them to have them in bloom in time. It seems that the lily is especially adapted for that purpose, for an Easter without lilies would seem to be no Easter at all. There is the Calla lily, not so popular now as formerly, and Lilium candidum, or the Ascension lily, which used to be our only Easter lily—but now the Bermuda lily is grown almost altogether and preferred, as the flower is so much larger, and is always sure to bloom, and can even be had in bloom by Christmas and, in succession, all through the winter. The bulbs are imported from the Bermuda Islands, and should be planted in from five to seven-inch pots as soon as received, which will, generally, be the latter part of July, or early in August. Put them in a cool place in a frame with a little earth over the pots, and as soon as danger from frost is past they should be brought into a cool house, except those for early flowering, which should be put in a warm place close to the glass. Those for late flowering may be planted, and kept dry In this way the bulbs will keep better than when not planted. Those for Easter flowering may be kept in a temperature of about 45° to 50° until the first of February. After that, they must be put in a temperature of 60° to 65° until the buds are almost ready to open, and, if too early, they may be held back in a cold house or cellar until the time to use them. It is by far better to hold them back than to have to force them too much the latter part of the time, as the flowers will be better and stronger if allowed to open slowly.

Next is spiræa japonica, a white feathery flower with very nice dark-green foliage, which makes a very attractive decorative plant when in bloom, and is easily forced. Bulbs or roots are mostly imported, and planted in pots of a size to suit the roots; kept cool at first until started, then gradually brought into a warmer place until the buds are ready to open.

Next is the hydrangea, a hardy shrub, very valuable for Easter. It is one of the most showy plants when in full bloom, as the flowers of some varieties often measure over twelve inches in diameter. The Red Branch, a new variety, is one of the best flowers, large, very bright dark pink and a very free bloomer.

H. Otaksa, light pink, very large flowers, good bloomer.

H. Thomas Hogg, pure white, very free bloomer, but not so large as the former.

H. Paniculata, perfectly hardy, flowers white, will force easy.

To grow them and have them in good condition for spring-flowering, cuttings should be made early in the spring, and planted out in a frame in rich soil in the summer; given plenty of water during summer; and in the fall, before cold weather, lifted and potted and kept in a cool house until about 1st of January; then they must be put in a warmer place, temperature about 50°, for about a month, after that a temperature of about 60° to 65°, until the blooms are fully developed; then, if too early, they will keep a long time, but will keep better in a cooler house.

Another hardy shrub is deutcia gracilis, which is easily forced; flowers pure white.

Next, the azalea indica, native of China, very fine for Easter decoration. They would naturally bloom about Easter if kept in a cool house. Plants are mostly imported from Europe. The best are grown in Ghent, Belgium. They are early forced in bloom for Christmas, and can be had in succession all winter by bringing a few at the time into a warmer

house. Color of flowers are all shades, from pure white to the darkest red; and a plant in full bloom will cover the leaves completely and is a gorgeous sight.

The rose is always a favorite on all occasions, It always has been and probably always will be the "queen of flowers."

For Easter forcing, the hardy or hybrid perpetual varieties seem to be the best adapted.

The following kinds we have had the best success with: Madam Plantier, pure white; Gen. Jacqueminot, brilliant velvety-crimson; Alfred Colomb, dark red; Ulrich Brunner, bright cherry-red; Chas. Le Febre, reddish-crimson; Merville de Lyon, pure white; Mdm. G. Luizet, bright pink; Anna de Disbach, carmine; Magna Charta, bright dark pink.

They are all perfectly hardy in our climate. In preparing them for forcing there are different ways. One way is to start them from cuttings during winter, plant them out in the open ground in spring, cultivate them well during the summer, cover with litter or long manure during winter, and by the next fall they will be strong enough to lift and be potted for forcing.

Another way is to import roses from Europe, which are grafted on the roots of a wild rose. They seem to be the best for forcing in pots, and can be had about as cheap as they can be grown at home. After potting, they should be put in a cold house or cold frame, and kept there until about the 1st of January. After that they must be brought into a temperature of about 45 to 50 degrees, and when started well removed into a temperature of about 60 to 65 degrees. To have them for Easter, it depends a good deal on the weather. If there is much clear, sunny weather, they will come on a good deal faster and should be kept a little cooler, so as not to have them come in bloom too early. These grafted roses seem to be better for forcing in pots than those on their own roots, for the stock that they are grafted on is a very vigorous grower and makes the plants grow faster and bloom better; but for out-door planting they are not so good, for the roots will always throw up suckers, which, when not removed while small, will take the life out of the parent plant, and after a year or two there will be nothing but the wild rose. Those made from cuttings on their own root will not grow as fast at first, but after having a good start will make better plants and bloom as well as the others. A great many other flowers might be mentioned, but those named are the most important ones for that purpose.

DISCUSSION.

Prof. Connor, N. D: I would like to ask Mr. Nagel if he has ever had any experience with the Madame Plantier?

Mr. Nagel: I have a good many coming in bloom for Easter. It is a plant that must not be taken up too early. Take it up and top it, and keep it in a closed house. The temperature should not run over forty and should be kept mostly at thirty-five. You should be very careful not to force it too fast. If it is left long enough, say until about the first of January, and then put in a warmer house and cut back, it will be in full bloom by Easter.

Mr. Smith: About how much would you cut it back?

Mr. Nagel: Well, if the plants are strong enough we cut them back to two or three buds; otherwise, we leave them six or eight inches long.

Prof. Connor: Is the Madame Plantier considered a hardy out-door rose?

Mr. Nagel: Yes, it is one of the hardiest roses we have.

Mrs. A. B. Underwood: For a garden flower for summer-flowering, I consider the Crozy canna very valuable indeed. It begins to blossom very soon after it is put in the ground. It continues in bloom until the frost comes, making a brilliant display. It is a bright scarlet in color, generally, although there are also yellow ones. They are very handsome.

President Underwood: Mrs. Underwood is not as enthusiastic over the Crozy canna as I am. I wish that every one had a lot of them, because I think they would enjoy them. The flowers and foliage are very handsome and conspicuous. All the varieties are very nice, and you can get a grand display in your yard from them.

Mr. Elliot: I don't think our people appreciate the beauty of the Canna. There are a large number of varieties different in foliage and blossoms. They are very easily cultivated when you once get the bulbs started. You are going to have some difficulty if you undertake to grow them from seed. And you may, perhaps, do as I have done many a time, dig up the seeds to see whether or not they are sprouting.

Mrs. Stager: Can we buy them as seedlings, as we do seedling gladiolus?

Mrs. Underwood: I think the most satisfactory way is to get the plants, because many of the seedlings are not satisfactory.

Mr. Nagel: It is very hard to sprout the seeds without soaking them. Soaking will not do very well either; it is necessary to put them in a cup, and put boiling water on them. The outside shell is so hard that they do not sprout very easily. If you want to have satisfactory Crozy canna you must buy the roots; you will never get them from seed.

Miss Sara M. Manning: I want to ask for information about raising water lilies. They are advertised extensively in the catalogues, where it says they can be raised from the seed. I got some nice tubers from seed, but I don't know what to do with them now. The catalogues are very confusing. Some say that one root will completely fill a tub, and others say that you can get two or three in.

Mr. Nagel: I advise the lady to leave them in the tub until it gets too full. They always grow better in the first place to have a good many together. It is always better to keep the tub full of water.

Miss Manning: What kind of soil do they succeed best in?

Mr. Nagel: If you can get soil out of a lake where they grow, it is the best.

Mrs. Blackwell: I am interested in carnations, but I do not have much success in raising them. I would like to ask Mr. Nagel's opinion on the subject.

Mr. Nagel: It is easy to raise carnations in the greenhouse.

Mrs. Blackwell: I find the temperature too high in the house for them.

Mr. Nagel: The main thing is to get them started in the spring. They should be planted in the open ground in the summer, and not grown in pots. Pinch them back once or twice, and about the first of September they are ready to bud again. They should not be pinched back after the middle of July.

REPORT ON OUT-DOOR HERBACEOUS PLANTS.

L. R. MOYER, MONTEVIDEO.

The following plants are recommended for cultivation in Minnesota:

Hardy plants: Bleeding Heart; Perennial Phlox, (several varieties, especially the scarlet and white); Peonia, several varieties; Perennial Larkspur; Spiderwort, (Tradescantia); Daffodil, (especially the variety Van Sion); Double Buttercup (but the single one is handsomer); Columbine, (several varieties); Campanula; Lily, (especially Tiger Lily and varieties of the Speciosa); Hollyhock, (several varieties, especially the straw colored ones); Mallow, (several varieties); Pentstemon grandiflorus; Achillea; Asclepias tuberosa; German Iris, (several species, especially the dwarf variety); Silla Siberica; Grass Pink (Dianthus); Sweet William (Dianthus); Pansy.

Tender bulbs: Gladiolus (many varieties); Dahlia; Tuberous Begonia.

Annuals: Sweet Pea; Aster; Escholtzia; Phlox Drummondii; Scarlet Flax; Verbena; Mignonette: Candytuft.

HORTICULTURAL STRUCTURES AND IMPLEMENTS.

IMPLEMENTS AND CULTIVATION.

(A DISCUSSION.)

President Underwood: I might say a few words in regard to implements. We need implements fit for shallow culture. Perhaps, in some heavy soils you might want to get deep culture, but I think what we are striving for is to get as shallow culture as possible. I don't think that the double cultivators, which we used for a couple of years, were a good thing. We have converted ours into smaller cultivators, making them with eight teeth instead of four. I think we ought to be careful and not cultivate too deep. I find that more shallow cultivation at the proper time is better than deep.

Mr. Elliot: I think that we sometimes cultivate too deep, although I don't believe that we cultivate too often. I don't think the ideal cultivator has yet been invented. When we get it, I think we will find that it will cultivate deep at the middle of the row and shallow at the sides. As a rule, if people would cultivate before the weeds get the mastery, they would find it an advantage. I do not believe that there is anyone here who has cultivated too often. I was a good deal annoyed while traveling about the country this spring to see the way in which the weeds were over-topping everything in some places. I have often thought that, if we should get into our fields in the spring a little earlier, it would be much better for the crops. We are too apt to leave it until we see the weeds start, and I think that is improper. I think that we ought to do it as soon as the ground is dry enough to cultivate, and follow this right up through the season. Every time it rains the surface of the ground should be broken and loosened. I think that kind of cultivation would prove very beneficial.

President Underwood: I know from experience and not only from one year's experience but from a number of years' work in this line, that it is possible to cultivate too often. Of

course, it would depend some upon the soil and upon the weather. I do not believe in letting weeds grow, I do not advise anybody to do that, of course.

Mr. Patten: Isn't it better for the apple tree not to cultivate it too frequently? Frequent cultivation would advance its growth too fast, and it would not be as hardy.

Mr. Smith: I have paid particular attention to this question during this last summer. There were four or five agricultural societies that offered premiums for essays on corn growing, and I awaited the reports with considerable interest; and I noticed that this thought ran through every one of the essays, that were awarded prizes. Now, it might have been the style that captured the judges, but all of those essays laid great stress on frequent and shallow cultivation.

Prof. Connor, North Dakota: I think our president's theory is a good one in some respects, but it seems to me that it would depend very much on the surrounding conditions. Now, for instance, if we had a heavy rain and it came off dry after it with a bright sun, I think then that we ought to cultivate immediately. It makes no difference, even, if we have just finished cultivating the night before this rain. This rain might cause a crust, and we should go on and break that, because we know it is necessary that the air should have access to the roots. Our plants feed largely that way. I think shallow cultivation is the best on young evergreens, for instance, those that have just been set. Deep cultivation is wrong, I believe, in such a case, and on small grafts, because we must keep the air from those roots for the first year, at least. I believe in shallow cultivation on grapes. It seems to me that deep cultivation would injure them.

Mr. Allyn: Just one word in regard to frequent cultivation. I think we can have too much of it. It is often said the more cultivation, the greater the crop. I plow deep, manure heavily and work it in well. I feed my plants in that way, and do as little cultivating as possible. I will guarantee that, if your ground is well manured, the cultivation will not make a great deal of difference in the amount of the crop, if it is not neglected too much.

Mr. Mitchell, Iowa: I am somewhat surprised to hear this objection to frequent cultivation. I have been cultivating quite a number of years, and I am fully convinced that you can not cultivate too much.

President Underwood: How many times a week do you cultivate?

Mr. Mitchell: Well, I don't cultivate as often as I would like to. Some of my crops I cultivate but once in two weeks, and others I cultivate every week, and I would cultivate twice a week if I could get around to do it. If we are having a good deal of rain, and the ground is wet, I don't cultivate at all, because the ground will be softer and looser; then again, you are apt to bake the ground if you cultivate it when it is too damp. I always want to stir the ground as soon as possible after a rain, when the ground becomes dry enough to cultivate.

President Underwood: I think you all readily see that it depends upon the weather and soil and location and every thing of that kind. Of course, no one is advocating a slovenly tillage or anything of that kind. Of course, every one knows that after a heavy rain, when the ground becomes dry, you should go out and break it up. We have all agreed that a fine mulch on the ground is a very good thing, and this broken-up ground acts in the same way.

A CONSERVATORY.

(A TALK.)

President Underwood: Mr. Elliot asked me to say something on greenhouse structures. It has just occurred to me that I can say something that would be of benefit to you all, I think. It is not so much in the line of a greenhouse as a place to grow flowers in. I don't care what kind of a house you have, if you will scrape together a little money and put up a little lean-to on the south or east side, about ten feet wide and, perhaps, fifteen feet long, with a Portland cement floor, you will be able to raise all the flowers you want. You can build it as cheaply or as expensively as you wish to, but you can have just as good a place to grow flowers in with a little expenditure as though you spent ten times as much, and the satisfaction of raising them will repay you. I think that every one ought to have a little place to raise flowers in. We have heated ours for a number of years with a common Stewart stove. A large size Stewart stove will do it all right. We have hot water now, and, of course, hot water or steam will do it as well.

Dr. Frisselle: It is built like a lean-to, is it?

President Underwood: It is built like an old Dutch chimney. It is a porch built right out from the room. You beautify your room and have a nice place for your plants.

Mrs. Kennedy: Do you have a glass roof?

President Underwood: No, it is a common roof. You can build it with tar felt paper and gravel, if you want to. That makes a very cheap roof at $2.00 per ten feet square. It is the warmest roof that can be built. If every farmer in Minnesota had one of these flower rooms, he would think it was worth more than the rest of his house after he had had it a year.

SUGAR AND SYRUP.

MAKING MAPLE SYRUP.

E. A. LANE, CHOWEN.

Mr. President, ladies and gentlemen:

It is not my purpose, neither is it expected of me, to give to this honorable body scientific facts or a method resulting from a scientific study of the subject assigned, but, merely, to give you one method of making maple syrup.

After having tapped the bush, which in my experience I have found hardly practicable to do before the first of April, I use for storage and boiling purposes a sorgum outfit, arranged, as most of them are, on a side hill, giving an excellent opportunity for settling sap and straining from one tank into another. I have on this incline, or side-hill, three tanks and a barrel, which the sap passes through before entering the boiling pan, and is strained from each as it passes from the one into the other. A tank holding three barrels is placed on the side-hill just above the level of the top of the boiling pan, with two others on top of this, holding one and one-half barrels each; and from these, up the hill, just above the level of the top tank and twenty-five feet away, connected with inch pipe, is a large barrel into which the sap is first strained. Thus it is that the sap finds its way into the boiling pan, which is a Stubbs No. 4 Evaporator. As the sap passes through these different apartments for storage, it is strained from each and allowed to settle as long as circumstances will permit.

We have found that the more sediment we can take from the sap before boiling the better it is for the syrup; have also found that by boiling batches of from five to eight barrels at a time, the syrup is much clearer and lighter colored than by boiling larger quantities. In boiling in a pan which has so much surface one has to be very careful. We can, with the utmost care, boil five, eight or twelve barrels down to eighteen or twenty gallons; when we either run our fire very low or draw it out. After the pan begins to cool so that there is no danger of burning, we draw off the semi-syrup into a barrel which has a faucet up on the side about two and one-half inches from the bottom; this gives the sediment room to settle below the place of drawing off. It is then taken to the house, allowed to settle twelve hours, if possible, and then drawn off into a finishing pan made of galvanized iron, two feet square and nine inches deep, and then boiled down to syrup thickness. It is then taken and allowed to settle again, when it is poured into large tin cans. What we wish to keep through the year, and perhaps longer, is put up cold into glass cans or bottles. In putting into bottles or cans, you are sure to make little bubbles of air. The cans before sealing must be free from these, which is accomplished by leaving open from three to six hours. This method we have found in our experience more satisfactory than any other.

COOKING AND PANTRY STORES.

FOOD PREPARATIONS.

MRS. A. B. UNDERWOOD.

Fruit in its natural, fresh state is the most acceptable either for eating out of hand or for table purposes. Unfortunately, there are some months of the year when fresh fruits cannot be obtained, and the healthy appetite craves something as a substitute. The apple is always with us, and should appear on the table three times regularly—as regularly as the bread plate. But, for the sake of variety we must test our ingenuity and see what glass jars and sugar will do for us.

There are many ways of putting up fruit, and among them the old "pound for pound boiled down to a ropy consistency" way is not out of style yet; and even jelly boiled until it is lifeless, but *thick*, is often seen.

In putting up fruit, the aim should be to retain the natural fragrance and flavor. In our household, strawberries, raspberries, currants, gooseberries, grapes and blackberries, when to be used as sauce, are put up without sugar. Only sound fruit should be used for this purpose. Fill the glass jars as full as possible by gently pressing down the fruit; then place them in a boiler with about four inches of water in it; have a piece of board or old cloth in the boiler for the jars to stand on, to prevent breaking. When thoroughly cooked through, take out of the boiler. The fruit will have settled greatly; so take one jar and fill the others from it to within one-eighth inch of the top; this space fill at once with boiling water, and put the covers on immediately. After standing awhile, be sure the covers are on tight, and when perfectly cold, try them again.

When needed for use, pour the contents of a jar into a sauce dish, add about one-half pint of water to a quart of fruit and as much sugar as desired; let it stand about five minutes, and it is ready for use. The flavor of any fruit is injured by cooking in the sugar.

The thought of green gooseberries put up in this way sets one's teeth on edge. But, when these are poured out of the jar to use, take the potato masher and *mash thoroughly*; then add a pint or more of water to a quart of fruit and *lots* of sugar, and you will have a delicious sauce.

In making jellies and jams, don't boil "twenty minutes" or more after putting the sugar in. If it is necessary to evaporate juice or fruit, do it before the sugar is added, and then *just let it come to a boil* and pour at once into glasses. To be sure that the fruit is evaporated sufficiently to jelly, take equal quantities of juice and sugar into an old sauce plate, and let it come to a boil, and pour at once into glasses. To be sure that the juice is evaporated sufficiently to jelly, take equal quantities of juice and sugar into an old sauce plate and let it come to a boil; if after cooling it is not thick enough, let the juice simmer awhile longer, and try again. Then,

when it tests all right, put sugar into the juice and let it come to a boil and remove. Sometimes, if the fruit is over-ripe, it will not be firm next day; let it stand for a few days uncovered, or place it for a few hours in the drying oven.

For jellies and jams, measure the juice or fruit just before it is ready for the sugar, and then take equal parts—for jelly, a quart of sugar and a quart of juice—for jam, about three-fourths as much sugar as fruit. Always test jam in the same way as jelly, as sometimes the fruit will not demand as much sugar as at other times.

The finest currant jelly I ever made, was without cooking. The fruit was about three-fourths ripe, and when the sugar was added to the juice just warmed a little, it thickened so rapidly that one could hardly get it into the glasses; the flavor was exquisite. I don't know as jelly made in this way would keep any great length of time in glasses, but in sealed jars it would. Jellies and jams made as above may not rival the pyramids in hardness and stability, but they will be far more healthful and toothsome.

FRUITS IN NUTRITION.

MRS. CLARA S. HAYS, FARGO, N. D.

Horticulturists have delved deeply into the mysteries of plant growth. In the study of how plants are nourished by the soil and air, they have been amply rewarded by beautiful, luscious fruits, in which they have enabled the sun to store up so much of nourishment, sweetness and healthfulness. If chemists and physiologists would take the finished product and study it with as much success, telling us how fruits act in the nutrition of the body, we could use fruits more intelligently. We know the general importance of fruits and vegetables in our diet, and that they cannot be omitted from our fare for any length of time without evil results. Some chemists claim that the chalky deposits, causing the large, painful joints in rheumatism, gout, etc., cannot occur in the presence of most fruit acids. Cases illustrating the folly of limiting the diet to too few articles of food are so numerous that comment is not necessary. We now have, however, a new departure in this line in the numerous "grape cure" sanitariums, in which the "cure all" is the use of grapes and grape juice.

Further investigation and experiments are needed on the digestibility of fruits, also as to the aid given by them in the digestion of other foods. Mere analysis, as crudely performed by our present chemical means for studying human foods, can give us only a very partial knowledge of their percentage nutritious value, and nothing of their assistance in keeping the system in tone.

In the table below, I have summarized nearly all the analyses of fruits I have ever seen. This gives us the per cent. of the various classes of substances in each kind of fruit named. These analyses are mostly European, and may not closely apply to our fruits.

	*Sugar.	+Free acid.	Albuminoids.	Pectin bodies, gum, organic acids in combination.	Soluble ash ingredients.	Seeds, skins and cellulose —insoluble.	Pectin.—Insoluble.	Water.	
Gooseberries	7.118	1.437	0.416	1.179	0.351	2.788	0.648	86.211	.....
Currants	6.381	2.149	0.529	0.169	0.588	4.577	0.845	84.81	100.048
Strawberries	5.124	1.438	0.575	0.104	0.606	4.524	0.499	87.254	100.064
Raspberries	4.002	1.483	0.585	1.413	0.377	5.695	0.240	86.199	99.994
Grapes	14.925	0.743		0.543		6.09		75.21	.....
Cherries	10.288	0.787		2.763	0.650	5.431	0.690	79.480	100.08
Plums	2.839	1.002	3.195	7.097	0.467	4.832		83.357	103.54
Prunes	6.261	0.896	0.758	3.875	0.662	4.813	1.682	81.601	99.948
Apricots	1.335	0.832	0.610	7.696	0.737	4.713	0.575	83.488	.....
Peaches	1.572	0.673		8.917	1.335	8.402		80.768	.....
Apples	8.224	0.701		5.16		1.84	1.23	83.09	99.01
Pears	7.47	0.467	0.248	3.845	0.569	3.664	0.972	83.678	100.83
Blackberries	4.444	1.188	0.510	1.444	0.414	5.210	0.384	86.406	.....
Mulberries	9.192	1.860	0.394	2.031	0.566	0.995	0.345	84.707	.....

*Saccharose and fructose. +Expressed as hydrated malic acid.

Inspection of the table shows that about 90 per cent. of most of these fruits is water and seeds, and other insoluble and indigestible matters. Apples, pears, mulberries and grapes, have 15 to 20 per cent. of soluble and easily digested constituents. These four fruits are especially rich in sugar, which is the main nutritive substance in fruits, ranging from 7½ to nearly 15 per cent. Several, as plums, apricots and pears, have enough pectin to give them additional value as heat producing foods. The amount of albuminoides, or flesh-formers, is very small in all these fruits, less than 1 per cent. The free acids, the acids in combination and the soluble ash constituents, doubtless represent in part the qualities which give to fruits their flavor, their stimulating effect on the appetite, on digestion and on nutrition itself.

What we know of the use of fruits for their hygienic effect in our bills of fare is limited to empiricisms and generalities. Let the women, who must feed their families, encourage our chemists and physiologists to work on food rations for people as well as for animals, that we may better understand and appreciate fruits both as a medicine and as food. Fruits are rapidly becoming very popular with all classes of people, and deservedly so. All fresh fruits are highly prized by the housewife, as they require so little preparation and add much to the beauty and appearance of the table, to say nothing of their palatability and health-sustaining power. Uncooked fruits should be on our tables daily. Apples, plums, cherries, currants, grapes and all kinds of berries, are most acceptable at breakfast with which to begin the meal, and usually require no sugar, cream or any addition whatever. Uncooked fruits should also be used frequently for dessert. Cooking does not render many fruits more palatable, digestible, or improve their appearance. Uncooked fruit has its hygienic as well as nutritive effect. In serving fruits always have un-

cooked unless cooking improves them in some way, either in appearance, taste or wholesomeness. Fruits used without cooking should always be perfectly ripe and sound.

The rule among farmers is to eat uncooked fruit between meals. How much better to have a tastefully arranged dish of fruit on the table one or more times a day, that it may be eaten at the beginning or end of the repast. However, eating fruit between meals is less objectionable than eating most other foods at irregular times. Fruit at the beginning of meals helps overcome the tendency to eat rapidly and to excess.

Fruits are especially useful in the diet of children and invalids, though much of the beneficial effect is lost when used to "piece on" instead of being made a part of the meal. As a result, appetite is wanting when the proper time for eating other foods comes; the good effect of fruits on digestion is largely lost; and with children, skins, seeds and other indigestible portions are eaten, and often the fruit is not properly masticated, which always results in harm. In many families, it is almost impossible to find time to look to this matter at regular intervals, while at meal time it could be attended to without additional thought or care.

Of the various ways of preserving fruits for winter use, canning is, probably, to be most commended. Jellies, jams, spiced fruits, preserves, etc., are good, but not so useful for children, sick people, or well people, either, as fruits canned without the surplus sugar. Canning also requires less labor. Fruit juices should be canned for use in sickness and used as lemon juice in making the various ades, as currant-ade, strawberry-ade, etc. After a trial, you will be so well pleased that you will use the juice in this way while the fruits are in season, and can enough that it may be used for the family occasionally through the winter. These fruit juices are also very useful in making pudding sauces, etc.

We realize the great economy of using fruits plentifully in our diet, when we contemplate the hygienic effect of the free use of fruits. If our bodies are supplied with foods wisely selected and properly cooked, and our lungs continually filled with pure air, we have little to fear from la grippe and kindred ailments. Children can develop naturally into strong men and women, and are enabled to get much more of success and happiness in life.

APICULTURE.

APICULTURE.

MRS. J. A. BLACKWELL.

Bee keeping has reached such an exact stage now that considerable scientific knowledge of bees and plants must be had before success can be assured. The apiarist must not only know the natural history of the bees, but he must be a patient observer, watching his pets carefully, and ready at a moment's notice to improve upon their condition. A point that has not yet been fully settled is the relation between the bee keeper and the fruit grower. The value of the bees in fertilizing flowers and fruits is not disputed, and it is a question whether pomology could advance with such rapid strides as it does if it were not for the bees. Apiculture is the handmaid to horticulture, and the question remains whether the two ought not to be conducted together.

The fruits and flowers must be cultivated for profit, and when they are supplied, the rich nectar is prepared for many colonies of bees. The fruit grower now loses all this nectar, or allows his neighbor's bees to come and carry it away. By having several colonies of bees near his orchard, he would not only gather the fruit, but the nectar in their flowers, also. Little additional labor would be required for this, as the bees demand very little attention in the fruit season.

But, never since I commenced bee keeping have I had such an unfavorable spring for bees as the past one. When they came out of their winter quarters, they were in a poor condition, as they had already brood in all stages and greatly needed bright, sunny days to induce them to build up into normal colonies, but, instead, we had cold rains, snow and stormy weather for weeks at a time, when not a bee could wander out in search of new pollen or even water. Fruit bloom came and went by, while the bees were kept in the hives by cold, rainy weather, and the first of June found many colonies with but pints, where there should have been quarts, of bees. I fed during this time about fifty pounds of shorts, cornmeal and flour to keep them alive, and the 20th of May there was a snow storm, the heaviest I have ever seen at this time of the year—and I have lived in Minnesota 27 years. The first of June they gathered pollen from the plum blossoms, also from the apple, but not until the middle of June were they seen at work on the white clover, although it had been in blossom some time—but it did not seem to yield nectar; about June 20, they were seen working on late cherry and raspberry blooms. From this on, the apiarist could begin to detect that familiar hum when they are commencing to get plenty of nectar. I feel satisfied with the returns from my bees this season; from 22 colonies I received over 800 pounds of extracted honey, while some of my apiarist brethern did not get much, if any, honey for their labors.

Mine all had plenty of stores to winter upon when put away in their winter quarters, and at this writing are very quiet and show no signs of diarrhoea. May our horticulturists combine bees and fruit more in the future.

"But June came, and with it the sunshine;
It came as if meaning to stay;
The clover blossoms nod to the breezes,
The busy bees working away
Bring joy to the hearts of their keepers,
And teach us to never despair;
For He who gives all of our blessings,
Knows how to, and when to, and where."

BEES AS FERTILIZERS.

A. J. COOK, AGRICULTURAL COLLEGE, MICH.

Read at the Association for the Advancement of Agricultural Science, Washington, D. C.

Darwin's memorable researches and generalizations in relation to the fertilization and cross-fertilization of plants through the agency of insects are not the least of his many valuable scientific discoveries, nor, yet, are they least in their bearings on economic questions. His classic investigations settled the question of the great value of insects in securing full fruitage to many of our most valuable fruits and vegetables. Since Darwin, many scientists have by crucial tests and experiments abundantly confirmed his conclusions. Our more intelligent, practical men have also made significant observations. They note a scarcity of insect visits to the blossoms of the first crop of red clover, and, also, its failure to bear seed. The alsike clover is freely visited in early June by the honey-bee and bears a full crop of seed. In New Zealand, the red clover failed to seed at all seasons, and there was a conspicuous absence of insects upon the blossoms, both early and late. This led to the importation of bumble-bees from England, to the earth's very limit, and now the New Zealand farmer produces clover seed. Gardeners keep bees to-day that their vegetables may fruit and seed more liberally. Even the producers of flower-seeds in our cities keep bees in their greenhouses, as they find this the easiest and cheapest method to secure that more perfect fertilization upon which their profits depend. Secretary Farnsworth, of the Ohio Horticultural Society, could account for a very meager crop of fruit a few years since, in his vicinity, after a profusion of bloom, only through lack of pollenization. The bees had nearly all died off the previous winter. I have often noted the fact, that, if we have rain and cold all during the fruit bloom, as we did in the spring of 1890, even trees that bloom fully are almost sure to bear as sparingly.

Darwin's researches considered insects as a whole, and it is true that all insects that visit flowers, either for nectar or pollen, do valuable service in this work of pollenization. Thus many of the hymenoptera, diptera and coleoptera, and not a few lepidoptera, are our ever ready helpers as pollenizers. Yet, early in the season in our northern latitudes, most insects are scarce. The severe winters so thin their numbers that we find barely one, whereas, we will find hundreds in late summer and early

autumn. In late summer, the bumble-bees and paper-making wasps number scores to each colony, while in spring, only the one fertile female will be found. This is less conspicuously true of solitary insects, like most of our native bees and wasps; yet, even these swarm in late summer, where they were solitary or scattering in the early spring. The honey-bees are a notable exception to this rule. They live over winter, so that, even in early spring, we may find ten or fifteen thousand in a single colony, in lieu of one solitary female, as seen in the nest of bombus or vespa. By actual count in time of fruit bloom in May, I have found the bees twenty to one of all other insects upon the flowers; and on cool days, which are very common at this early season, I have known hundreds of bees on the fruit blossoms, while I could not find a single other insect. Thus we see that the honey-bees are exceedingly important in the economy of vegetable growth and fruitage, especially of all such plants as blossom early in the season. We have all noticed how much more common our flowers are in autumn than in spring time. In spring, we hunt for the claytonia, the trillium and the erythronium. In autumn, we gather the asters and golden-rods by the armful, and they look up at us from every marsh, fence corner and common. In May, *our* flowers demand a search, while in California the fields of January and February are one sea of blossoms. The mild California winters do not kill the insects. There a profusion of bloom will receive service from these so-called "marriage-priests," and a profusion of seed *will* greet the coming spring-time. Thus, our climate acts upon the insects, and the insects upon the flowers, and we understand why our peculiar flora was developed. Yet, notwithstanding the admirable demonstrations of the great master, Darwin, and the observations and practice of a few of our intelligent, practical men, yet the great mass of our farmers are either ignorant or indifferent as to this matter, and so to the important practical considerations which wait upon it. This is very evident, as appears from the fact that many legislators the past winter, when called upon to protect the bees, urged that fruit growers had interests as well as the bee-men, not seeming to know that one of the greatest of these interests rested with the very bees for which protection was asked.

Now that we understand the significance of the law of adaptation in reference to the progressive development of species, we easily understand why our introduced fruits that blossom early would find a lack of the "marriage-priests," and why it would be a matter of necessity to introduce the honey-bee, which, like the fruits, are not indigenous to our country; just as the bumble-bee must go with the red clover if the latter is to succeed at once in far-off New Zealand.

It is true that we have native apples, cherries, plums, etc; but these, like the early insects, were scattering, not massed in large orchards, and very likely the fruitage of these, before the introduction of the honey-bee, may have been scant and meager.

Now that spraying our fruit trees with the arsenites early in the spring is known to be so profitable, and is coming and will continue to come more generally into use, and as such spraying is fatal to the bees if performed during the time of bloom, and fatal not only to the imago but to the brood to which it is fed in the hive, it becomes a question of momentous importance that *all* should know that bees are valuable to the

fruit-grower and the apiarist alike, and that the pomologist who poisons the bees is surely "killing the goose that lays the golden egg." That bees are easily poisoned by applying spray to trees that bear nectar-secreting blossoms at the time of bloom can be easily demonstrated by any one in a very short period of time. It has been demonstrated in a frightfully expensive manner in several apiaries in various parts of the country. Several beekeepers, whose all was invested in bees, have lost all this property, all because some fruit-growing neighbor either thoughtlessly or ignorantly sprayed his fruit trees while in bloom; and this in the face of the fact that for the best results, even in the direction sought, the spraying should be deferred until the blossoms fall. I have demonstrated this fact, where the results were entirely in sight. I have shut bees in a cage, and given them sweetened water containing London purple in the proportion of one pound to two hundred gallons of water, and in twenty-four hours the bees were all dead; while other bees in precisely similar cages and fed precisely the same food with the poison omitted lived for many days.

We thus see that it becomes very important that pomologist and beekeeper alike know the danger, and also know the loss to both parties in case caution is not observed to avoid the danger and probable loss. It is also important that by definite experimentation we may learn just how important the bees are in the pollenization of plants. To determine this point, I tried many experiments last spring. I counted the blossoms on each of two branches or plants of apple, cherry, pear, strawberry, raspberry and clover. One of these, in the case of each fruit or each experiment, was surrounded by cheese-cloth just before the blossoms opened, and kept covered till the blossoms fell off. The apple, pear and cherry were covered May 4th and uncovered May 25th and May 19th. The number of blossoms considered varied from thirty-two, the smallest number, to three hundred, the largest. The trees were examined June 11th, to see what number of the fruit had set. The per cent. of blossoms which developed on the covered trees was a little over two, while almost twenty per cent. of the uncovered blossoms had developed. Of the pears, not one of the covered developed, while five per cent. of the uncovered developed fruit. Of the cherries, three per cent. only of the covered developed, while forty per cent. of the uncovered blossoms set their fruit. The strawberries were covered May 18th and uncovered June 16th. The number of blossoms in each experiment varied from sixty in the least to two hundred and twelve in the greatest. In these cases, a box covered with cheese-cloth surrounded the plants. The plants were examined June 22d; eleven per cent. of the covered blossoms and seventeen per cent. of the uncovered had developed. To show the details, in one case sixty blossoms were considered, nine of which in the covered lot, and twenty-seven in the uncovered, had developed. That is, three times as many flowers had set in the uncovered as in the covered. In another case of two hundred and twelve blossoms, the fruit numbered eighty and one hundred and four. In a case of one hundred and twenty-three blossoms, the number of fruit was twenty and thirty-six.

These experiments agree with similar ones of former years in seeming to show that strawberries are less affected than other fruit by the exclusion of insect visits. The raspberry canes were covered with cheese-cloth

May 30th, and uncovered July 6th. In every case but one, the canes seemed to have been injured by the covers, and so the results were not considered. In the exceptional case, one hundred and eighty-four blossoms were considered; ninety-three blossoms developed on the covered canes, and one hundred and sixty on the uncovered. In every case the fruit on the covered twigs was inferior. It might be thought that the simple presence of the covers was prejudicial; though this could not be a very important matter, as blossoms covered after the bees had freely visited them set well, and showed no injury. Thus we see that in all our fruits—in strawberries the least—the free visits of insects during the period of blooming is absolutely essential to a full or even a fair crop. In many cases, the covered blossoms all failed to develop. We also see that where fruitage does occur there seems a lack, as the fruit lacks vigor. The free and ample *cross-fertilization* seems to be requisite, not only for a crop, but for a perfect development and maximum vigor.

Our experiments with clovers were tried with both the white and alsike. While the uncovered heads were full of seeds, the covered ones were entirely seedless. This fully explains the common experience of farmers with these plants.

Having the law of the necessity of insects to accomplish this function so well demonstrated, it might be asked, "Why do we have *any* fruit in case the blossoms are covered?" This seeming exception may be no exception. Indeed, this may come from the fact that *all* insects are not excluded. Very small insects, like the thrips and various of the jassidæ, which we know are often attracted to flowers either by the pollen or nectar, would be concealed about the plants, and from their small size might gain access even after the covers were adjusted. These would be sufficient to secure partial fertilization, and very likely are the cause of the meager crop which, in a few cases, we secure even on the covered twigs.

In the case of strawberries, our experiments this year, like some previously tried, seemed to show that the presence of insects, though important to a maximum production, are not so necessary as in case of nearly all other fruit. But, we must remember that the strawberry plants are not wholly inclosed. A cloth-covered box rests on the ground about the plant. This gives a fine chance for insects that burrow in the earth and for insects that have pupated in like position to come up during the three or four weeks of the experiment, and pollenize the blossoms. This, though a possible—and shall I say, a probable explanation?—may not be the real one. But, we can still affirm in the case of the strawberry, that the free visits of insects serve surely to much enlarge the production of fruit.

Thus we see that our horticulturists and farmers alike with the apiarist are dependent for the best prosperity on the presence and well-being of the bees. They should realize this fact, and should demand that our legislators not only become informed, but act accordingly.

ORNITHOLOGY.

OUR BIRDS.

MRS. G. F. BENSON, LAKE CITY.

"All day I have been hunting
For ends of scarlet bunting,
For pieces out of rag-bags whose colors make a show;
Fragments of red or azure,
Bright bits of doll-house treasure,
And faded bows and ribbons worn many years ago.

"From sill and from projection
I hang this gay collection;
I strew the lawn and garden path, I fringe each bush and tree;
I dress the door and casement,
The garret, and the basement,
Then watch to see if birds, perchance, will use my charity.

"There comes a pretty chatter,
There comes a fairy patter
Of tiny feet upon the roof and branches hanging low,
And flirts of wing and feather,
And little strifes together,
And sheers, and flights, and flutterings, and wheelings to and fro.

* * * * * * *

"The stock is just diminished,
And when the nests are finished,
The nests of orioles and wrens, of robins and of jays,
In pleasant summer leisures,
I'll watch the rag-bag's treasures
Swing in the wind and sunshine, above the garden ways."

Those who, like the author of these sweet child-verses, try their hand at "Helping the Birds," will find their efforts amply rewarded by the increased confidence of the little creatures, and by the discovery of individual traits, which develop on close acquaintance.

One of the pleasures of living in a village is the opportunities afforded by the spacious lawns and gardens with their many trees and shrubs for the study and enjoyment of bird-life; and I know of no place where the birds have more friends who love them, pet them and try to protect them than our own little "City" by the "Lake." Many lawns have a space devoted to the use of the birds, where crumbs and seed are thrown, and where water is kept in shallow pans for their daily bath. The little things soon learn to look upon this spot as their exclusive property, and grow so tame that they will quarrel over whose turn it is to take a bath, while the hammock ten feet away is occupied by an interested and amused spectator.

In the winter, a large piece of suet is fastened to some convenient post or tree, where the blue jays, downy woodpeckers and nut-hatches come daily for a good square meal. The chickadees also take a little lunch occasionally, not that they are fond of suet, but just to let us know that they appreciate our good intentions.

Last spring was a disastrous one for many of our birds. The long continued cold, wet weather kept the insects from appearing, and hundreds of purple martins died of hunger. Other insectivorous birds were found dead on the ground, and many hummingbirds were overcome by the cold and perished.

As the trees were late in putting forth their leaves, the robins, who like to get to housekeeping early, were much disturbed, but finally solved the difficulty by building their nests nearer the houses than usual. I had the pleasure of turning carpenter for two pairs of robins who were determined to build on the caps to the pillars of the veranda, where they had not sufficient room. Half of a shingle and a couple of nails for each post was all that was needed to make their happiness complete, and the whole process of nest-building, feeding the young and teaching them to fly, was gone through with only six feet away from my windows.

I had always wished for a robin's nest on my porch, but that I should have two in one season exceeded my wildest dreams. I found that eternal vigilance was required, until the birds began setting, to keep the mischievous English sparrows from destroying the nests. It was so much easier to take for their own nests the material the robins had gathered than to hunt it up for themselves.

By the way, it occurs to me that these sparrows do not belong to us. They were imported especially for the cities, and although it seems inhospitable, yet, if the cities would kindly keep their sparrows at home, we would be *so* much obliged.

One of the greatest enemies of our birds has been the small boy with his sling-shot or air-gun. Thinking that many of the boys were ignorant of the fact that they were violating the law, our mayor caused copies of the law prohibiting the killing of birds to be printed, and, besides posting them in conspicuous places, sent one to each teacher in the public schools, requesting her to read and explain it to her pupils. The plan worked beautifully, and if it were imitated in every town in the state, it would be a most excellent thing. I would like to see this horticultural society and the various ornithological societies of the state united in a vigorous effort to protect our "little brothers of the air." It is as true to-day as when in the early days of the century our old friend Thomas Nuttall wrote it that "In whatever way we view the feathered tribes which surround us, we shall find much both to amuse and instruct. We hearken to their songs with renewed delight, as the harbingers and associates of the season they accompany. Their return after a long absence is hailed with gratitude to the Author of all existence; and the cheerless solitude of inanimate nature is by their presence attuned to life and harmony. Nor do they alone administer to the amusement and luxury of life; faithful aids as well as messengers of the seasons, they associate round our tenements, and defend the various productions of the earth, on which we so much rely for subsistence, from the destructive depredations of myriads of insects, which, but for the timely riddance by unnumbered birds, would be followed by a general failure and famine. Public economy and utility, then, no less than humanity, plead for the protection of the feathered race, and the wanton destruction of birds so useful, beautiful and amusing, if not treated as such by law, ought to be considered as a crime by every moral-feeling and reflecting mind."

THE FOOD OF BIRDS.

ALBERT LANO, MADISON.

I have chosen this for my subject, not because it is a new one, but I wish to bring it to the notice of this society, with the view of saving some innocent bird-lives, and doing good to my fellow men.

Every practical and observing ornithologist knows quite well what constitutes the principal food of the different orders and families of birds, and needs, therefore, no information on this subject. It is then for your benefit that I give my personal experience and observation here.

There are no other classes of men that derive so much direct good from the birds as do the horticulturist and the farmer. No matter how much rain we have at the right season, no matter how much sunshine and favorable weather, nor how much pains you have taken with the best kind of soil, the insects would spoil the crops, or at least a good share of them, were they not greatly diminished all the year round by the feathered tribes of the air. Some of the birds live entirely on insects, summer and winter, while others only during the breeding season in the spring and early summer. There is not a single native bird in North America that needs to be killed off for the damage it does. It is true that some of our native species can and will do some damage. The beautiful robin, that had its nest in your yard and sang to you all spring and summer, will pick a grape or a cherry in the fall—but why not? Has he not eaten the worms and beetles from the vines all summer? Indeed he has, and has brought up a large family, besides, on worms that he found in your garden. There are other species that can and will do a little damage in the orchard in this way, but it is so small that I do not believe one of us is justified in killing a single bird. Should they become too numerous in the vineyard or orchard while fruit is ripening, and you notice that damage is being done, you can easily rid yourself of them by firing a gun, but be very careful not to aim at the birds themselves.

The amount of insect food consumed by a single bird in one day is wonderful; some observers have tried to estimate the number, and have found that one bird will eat many thousand.

I prepared a nighthawk last summer that weighed 2¼ oz. The stomach contained ¼ oz. solid insect food. It can readily be seen that these birds will eat many times their own weight of insects in one summer. In another specimen, I found a potato bug.

A member of the committee on ornithology, two years ago, advised the killing of the "sap sucker", or yellow-billed woodpecker, because, he said, they did so much damage in the way of boring trees for sap. This bird is, no doubt, a "sap sucker," but he cannot live on sap alone, no more than the hummingbirds can on honey. His tongue is somewhat different from his cousin's, but his principal food is insects, just the same. The sap season is only a short one, and the damage can only be very small. Let me tell the same gentlemen that trees like the fir and other evergreen trees have no sap! This bird, like all, does more real good in one day than all the damage he can do in a year. Therefore, I say, do not diminish his species by killing a single one. So much for seed and insect-eating birds.

Hawks and owls will in time become extinct, unless they are protected by the farmer, instead of being persecuted by these gentlemen as well as by any one that is able to carry a gun. I say protected by the farmer, because they own the land and derive the most benefit from these birds

The food of owls consists of small animals, such as mice, gophers and rats. I have found but a single instance where the stomach of a snowy owl contained the remains of a western meadow lark, and I have examined dozens and dozens of stomachs of the owl tribe that inhabit this state. When you see an owl near your barn, it is not for the chickens in your coop that she visits there, but the mice and small animals that are apt to be there.

Hawks are not very much different from owls as regards food. They will, however, capture small birds once in a while, and some of the species a chicken, if they can get it. But the damage that is done is so small if compared to the benefit they do in the way of destroying gophers and mice in our fields, that they deserve our protection. I examined the stomach of a western red-tail hawk, at Excelsior, that contained about a dozen frogs. I presume they want, as we do, a change once in a while.

The United States government spent thousands of dollars a few years ago to investigate this subject of damage done by hawks and owls, and if any of you gentlemen wish to see for yourselves, I refer you to that report. Unless you wish to make use of a bird, whether it is a robin or an owl, do not kill or allow it to be killed, on your premises. If a hawk becomes troublesome about your poultry yard fire off a gun once or twice and he will stay away, but do not kill him. Would you kill your pet dog or cat if they had made a mistake in your yard? No, indeed! but you would, probably, punish them. Do all you can to have the birds stay on your farms and gardens. Put up bird houses for the purple martins and the bluebirds in your garden. But, watch it! if that imported little nuisance, the English sparrow, troubles them, kill him as you would a rat.

ENTOMOLOGY.

REPORT OF COMMITTEE ON ENTOMOLOGY.

J. S. HARRIS, LA CRESCENT.

Mr. President—My observation of insects in 1892 has been confined to southeastern Minnesota, and I have not much that is new or very interesting to offer. I am glad to report that, so far as my observations go, no new destructive insect has made its appearance during the year, and that the old species that have been long with us have not been so numerous as to create increased alarm, or nearly as plentiful as in some former years; neither have the beneficial insects, or birds that feed upon insects, been as common as usual.

In point of fact, the insect or bug crop, with two or three exceptions, was a partial failure, much more of a failure than in 1891. These things, however, should not make us too sanguine that we are about to get rid of them or to keep them sufficiently in check to prevent serious damages in some coming years. The fact must always be borne in mind that the females of most species are extremely fertile, or oviparous, and of many there are two or more broods in a year, therefore, whenever the season is favorable and suitable food at hand, they multiply so rapidly that the progeny from a single pair would overrun the whole state in five years if they could be protected from their natural enemies. The horticulturist cannot rest in security until the last one has been annihilated.

The spring of 1892 was backward and extremely wet, with more dull cloudy days than we are accustomed to note in this region famous for its bright suns and clear skies. At the time when our fruit trees and plants were in bloom, there were many days so unpleasant that no insects, not even the busy bee, were seen working in the flowers, and it seemed doubtful if enough flowers would become pollenized to ensure a crop of fruit. Very few of the young apples were the receptacles of the eggs of the codlin moth, and, no doubt, a persistent effort to prevent the second crop would have resulted in a marked decrease of this serious pest for several years to come. Spraying the young fruit as soon as formed, and the petals of the flowers have fallen, with a solution of Paris green, one ounce of the green to twelve or fifteen gallons of water, and repeated two or three times afterwards at intervals of a week between, has been found to reduce the numbers of wormy fruits very materially; and if it was universally practiced every spring, and followed by trapping and destroying the mature insects when they leave the fruit to undergo the last transformation from worm to moth, under artificial bands of cloth or paper placed about the trunks of the trees, the pest would very soon be eradicated. The bands should be placed around the trunks of the trees about two feet above the ground, towards the last of June, and examined once a week, and the larvæ found under them all destroyed, until the entire fruit crop has been gathered on or about the first of October.

The native plum crop, having proved a total failure, we cannot report very definitely on the plum curculio. We know that they were present in considerable numbers at the time the trees were in bloom and the fruit forming, and we do not think that any fruit remained upon the trees long enough to allow the eggs to hatch and feed the young grub to maturity. It is to be hoped that they have not found some to us unknown means for securing a subsistence and perpetuating their kind—a blessing that would reward us well for the loss of one crop of this very valuable fruit. In some orchards, we find the apple curculio, or gouger, got in his usual work, and some extra. In our observations, we have found them much the worst in old, uncultivated and neglected orchards, and increasing with a rapidity that should create alarm and call for vigorous efforts to head them off. The surest remedy against them appears to be making a hog pasture of the orchard at certain seasons of the year. They have appeared first in the timbered portions of the state where the wild thorn apple is more or less abundant. The domestic apple furnishes them a more congenial food, to which they get accustomed quickly, and on which they multiply rapidly. Spraying, thus far, has not given satisfactory results. Jarring the trees and catching the beetle is a tedious process, but the best that I know of, besides the hog remedy. Last fall, we visited an orchard in Fillmore county, which was carrying a crop of over two thousand bushels, and in a careful search of half an hour could find but two specimens of fruit that showed any marks of the work of the gouger. In another orchard but a few miles distant, that has in years past been noted for its fine fruit, more than three-fourths of the fruit showed the marks of having been stung, and one-half of it was unmerchantable. In the first orchard, pigs are pastured until the fruit is ripe enough to use, and after the fruit is all gathered, a drove of hogs are turned in and fattened by feeding them unhusked corn scattered from a wagon, driven between the rows; the other is seeded down to grass. One is the most profitable orchard in the state, the other will not much longer pay the expense of harvesting the fruit, unless the curculio is headed off.

The canker worm and the dent caterpillar did not make their presence conspicuous. For many years, I have not seen fewer of the May beetle or June bug, but, still, there were enough of them to make it unsafe to set a strawberry bed for two years to come on ground that last June was carrying a good crop of grass and weeds. The currant worm appeared at about the usual season in about the usual numbers, and heavy rains washed off the white hellibore soon after it was dusted on; but they left us some fruit, and have not injured the bushes as seriously as last year. The potato beetle was very scarce, very much more so than in 1891. On our own place there were virtually none, and our friends Mr. Rosebreasted Groesbeak and his wife changed their residence to a neighboring farm, where they could get supplies for their family at less trouble and expense.

We have never known the common house fly to be so scarce as in 1892. Of some kinds of insects, the late crop turned out better. That was the case with the European cabbage caterpillar. Few of the butterflies were around in the early part of the season, but in July and August they were more plentiful than usual and did great damage to late cabbage and cauliflower. In certain districts the common grasshoppers were numerous enough late in the summer to do considerable damage to young

fruit trees by devouring the leaves. The latter part of the season was very dry and favorable for the green ant and brown aphis, that work on the young growth of the apple, plum, and some other trees and plants. In some places, the apple and plum trees suffered seriously by the young leaves becoming curled and blackened, growth ceased, and, in some instances, the twigs have died back several inches from the ends. In September, we observed considerable numbers of a minute species of the ichneumon fly hovering around some apples that contained the codlin worm. This insect has a habit of depositing its eggs in living insects. These eggs hatch, and the young feed upon the vitality of the worm when in the pupa state, causing it to perish; and there is a faint hope that this little fly has come to deliver us from much longer feeding upon wormy apples.

REPORT OF COMMITTEE ON ENTOMOLOGY.

DR. M. M. FRISSELLE, EXCELSIOR.

I have had little opportunity during the past season to make extended observations on the destructive work of such insects as are obnoxious to the horticulturist. However, there are a few varieties that have forced themselves on my notice, and proved troublesome in the region about Lake Minnetonka and other adjacent sections of country. The forest caterpillar, cabbage worm, squash beetle, currant borer and Colorado beetle, have been the most numerous and offensive. The first, the forest caterpillar, *cliseocampa sylvatica*, made its appearance early in May, just as the forest trees were putting out their tender leaves. They appeared in countless numbers, completely denuding the forest trees of their foliage. They invaded the garden, stripping not only the raspberry bushes, but making a vigorous attack upon the currant bushes and grape vines, though doing little damage to the latter. They made sad havoc, however, with the apple and plum trees, and rose bushes. No remedy seemed to avail much in hindering them in their destructive work, except kerosene oil, and that destroyed all plants and small trees to which it was applied. For some reason a very large portion of the caterpillars died before maturing and retiring in cocoons, which favors the comforting belief that few will appear during 1893.

The cabbage worm, *pieris rapae*, was more numerous than I have ever known it before, and the few hundred plants set in my own grounds were all destroyed; and from the high price of this valuable esculent in all our markets, I conclude that the cabbage worm has held high carnival throughout this region of country. Many remedies for this pest have been suggested, but few, if any, seem to have proved efficient. From all experiments it would appear that dust of some kind is most effectual, and that which seems least objectionable is fine bran applied freely and frequently to the plant during the invasion of the insect. Some have applied road dust with good success. Others have used fine salt, and some, hot water. Whatever means are used, results seem to show that eternal vigilance is the price of good cabbage.

The currant borer, *aegeria tepuliformis*, is one of those destructive insects that are exceedingly difficult to circumvent. The egg of the insect is deposited in the stem just beneath the surface of the ground. The larvæ enter to the center, and then follow the pith. I know of no way of effectually preventing their depredations. The best that we can do is to cut off the supply by carefully hunting out the affected canes, collecting and burning them before the perfected insect makes his escape.

The squash beetle, *diabootica vittata*, the striped beetle, is perhaps the most common, though the *diabootica punctata*, or the twelve-spotted beetle, is almost as common and equally undesirable. Their habits are familiar to almost every one. Their invasion of the garden is sudden, coming about the last of May, when the squashes, cucumbers and melons have attained from one to five leaves, taking out all the soft portion of the young leaves, leaving only the skeleton. They deposit their eggs in the main stem, just at the top of the ground, and the larvæ generally succeed in cutting off the plant. I think there is no better remedy than very fine road dust mixed with a small portion of sulphur, frequently applied to the parts occupied by the insect. Their stay is short, and a few days of close attention to them will be likely to save the plants from destruction.

The potato bug, or the Colorado beetle, is another insect that is capable of much mischief, but, happily, we are in possession of a remedy that is effectual for his suppression and destruction, though when destroyed he, like the politician, is forever bobbing up again. Paris green (arsenate of copper), sparingly dissolved in water, is death to this vicious bug. It should be applied as soon as the plants appear above ground, so as to destroy the parent bugs before they deposit their eggs.

OBITUARIES.

SAM. PARTRIDGE.

DIED DECEMBER 14th, 1892.

Mr. Sam. Partridge was born in 1830, and lived until his eighth year in Birmingham, Warwickshire, England. The family then removed to London, where he received his education and commenced business in a publishing house. He afterwards removed to Leominster, where he and his brother conducted a large publishing house. He became interested in horticulture in London, and held the office of secretary of the horticultural society in Leominster for many years.

In the year 1873, he brought a colony of a hundred people from England, the most of whom settled on farms in Hawley, Minn. The cold winter following their arrival on the barren prairie, to those who were accustomed to luxury and the mild climate of sunny England, added to the grasshoppers, which destroyed their first years crop, was discouraging.

Mr. Partridge went in partnership with an editor in Moorhead, and published a weekly paper for several years. He held a number of public offices there. He was secretary of the public schools, and collected a fine library and museum for them. He was also secretary of the county fair. But no matter how much he had to do, he could always find time for a garden and the cultivation of flowers. *That* he thought recreation and amusement after arduous brain work in-doors.

In 1887 he was called to Hamline to assist at the state fair, and soon after invented a system of entry, which he used there afterward, and which is being introduced in other states. He was an accurate and indefatigable worker, and when the disease which caused his death fastened itself upon him, he was reluctant to give up his post, so great was his interest in the cause.

His death was ascribed to dilatation of the heart. He passed gently and peacefully away on the 14th day of December last.

Respectfully,

Moorhead, Minn. MRS. S. PARTRIDGE.

CHARLES ARCHIBALD CHANTER,

DIED DEC. 11th, 1892.

He was a native of Bedeford, county of Devonshire, England. He was 56 years of age, having been born June 15th, 1836. His parents were of good social position, wealthy, etc., what is styled in the old country "A county family," very ancient and influential. As soon as Mr. Chanter left school, he went to sea in one of his uncle's ships, visiting many foreign ports, and, being then an ardent botanist, he collected a great many valuable botanical specimens; ferns being his specialty. Later on, not liking the merchant service, he passed a naval examination and entered the British navy as an officer. While on board various of H. M. ships, he made further collections. While other officers were amusing themselves in the ports, he with a native guide devoted his leisure time to his favorite study, adding to his valuable collection specimens from every clime. Some few years later, he met with an accident on shore at home which enfeebled his health and

obliged him to resign his naval position. From that time until his death, he has with the greatest zeal prosecuted his favorite study. Though through loss of fortune, he has been obliged to devote some portion of his time to business engagements, it has never been allowed to interfere with his study of botany. He has, both in England and in this country, written several valuable papers on his favorite topic, ferns, his knowledge of that particular branch being wonderful. He was president of State Chapter Agassiz Association, and made an effort get up a chapter in Kilbourne City. Mr. Chanter was the means of keeping up a horticultural society in Kilbourne, consisting of, I think, one hundred and sixty members. By his energetic canvassing and enthusiastic love of flowers, etc., he gave the people a new interest in horticulture. His whole heart was in the work. With a view of erecting a huge greenhouse for the cultivation of tropical ferns, he bought a portion of the dell, "Artist's Glen," the spot chosen for that purpose, but failing to meet any encouragement from the residents (in fact, something more like opposition to his plans) he eventually sold the land to a company whose object was to improve the property as a summer resort.

Mr. Chanter was staying in Chicago at the time he met his death with the view of becoming an assistant in the horticultural department of the World's Fair. Mr. John Thorpe being a personal friend of Mr. Chanter, it would have been a source of great pleasure to him if he could have succeeded in his project. The Milwaukee & St. Paul Railway Company had engaged him to arrange their gardens at the railway stations. Last year he arranged a very pretty and tasteful garden at the Kilbourne depot. He possessed a bright, happy, hopeful disposition, and any number of failures did not daunt him. His predilection for botany was not a mere liking, but a life passion. A man possessing a large heart, a love for all mankind, as, also, a love for all the beautiful in nature—a religious man. As an illustration of his love for nature, I will give you a little incident. He preferred, whenever the opportunity occurred, praying in the woods or in some beautiful sequestered spot, to worship in a house; he said he felt that God was nearer to him, and was around in every tree and flower and blade of grass. I should advise all young people to study nature in her manifold forms—for who could be really wicked who possessed a knowledge and a love for the Creator's works?

I have known Mr. Chanter climb up rocks of great height and almost perpendicular to reach a specimen; he seemed to know no fear nor danger when a favorite plant had to be reached. He met his untimely death by falling, Dec. 11th, 1892, from an elevator, fifteen stories, in the Masonic Temple, Chicago. He was calling for a professor in the building to accompany him to Jackson Park, and was carrying a basket of tropical ferns to be planted in the park hothouse.

He was a life member of the Wisconsin State Horticultural Society.

In writing this little sketch I feel that I cannot do him justice, so many things might be penned by an abler writer; but I have given you sufficient to show the love he possessed for horticulture. All his friends miss him.

I forgot to mention that the reason for Mr. Chanter's coming to the States was to pursue in a larger field his study of ferns. He left England for the States in 1881.

Yours sincerely, MRS. LILLIAN CHANTER.

BIOGRAPHY.

R. J. MENDENHALL.

A BIOGRAPHICAL SKETCH.

(*See Frontispiece.*)

R. J. Mendenhall, a native of North Carolina, came to Minneapolis in 1856. Previous to this he joined a surveying party in New York City, came west, and was on a railroad survey in Iowa almost two years, crossing the state three times.

On February 11th, 1858, he was married at West Falmouth, Mass., to Abby G. Swift, daughter of Capt. Silas Swift, and together they came to this (then) young city, and planted a home and a flower garden.

From 1857 to 1873 Mr. Mendenhall was engaged in the banking business. From 1862 to 1866 he was president of the old State Bank of Minnesota, afterwards merged into the State National Bank of Minneapolis. During the financial panic of 1873, the savings bank with which he was connected "succumbed to the pressure," and the business thus summarily ended took several years to settle up.

Mr. Mendenhall's natural fondness for flowers led him to engage in floriculture as a pastime and future business, which has developed into the largest of the kind in the Northwest.

He was president of the Minnesota State Horticultural Society during the years 1871 and 1872.

He has done much to cultivate the tastes of the people in this direction, and has been a useful citizen in the city of his adoption for more than a third of a century.

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